JOURNAL
OF THE
AMERICAN VETERINARY MEDICAL ASSOCIATION

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Volume 127 AUGUST 1955 Number 941

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$10.00 per annum Foreign $10.50; Canada $10.50 Single Copies $1.00 Prepaid in U.S.

Published monthly at 600 S. Michigan Ave., Chicago, Ill., by the American Veterinary Medical Association. Entered as second class matter August 10, 1932, at the Post Office at Chicago 5, Illinois, under the act of March 3, 1879. Additional entry at Mendota, Ill. Accepted for mailing at special rate of postage provided for in Section 538, act of February 28, 1925, authorized August 10, 1932. Reproduction of any part of this publication is prohibited, unless special permission is given. Permission will be given if the purpose seems justifiable and, in signed articles, if the rights or requests of author are not violated thereby. Reprints should be ordered in advance. Prices will be quoted after publication. Please send prompt notice of change of address, giving both old and new. Advise whether the change is temporary or permanent. Address all correspondence to American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill.

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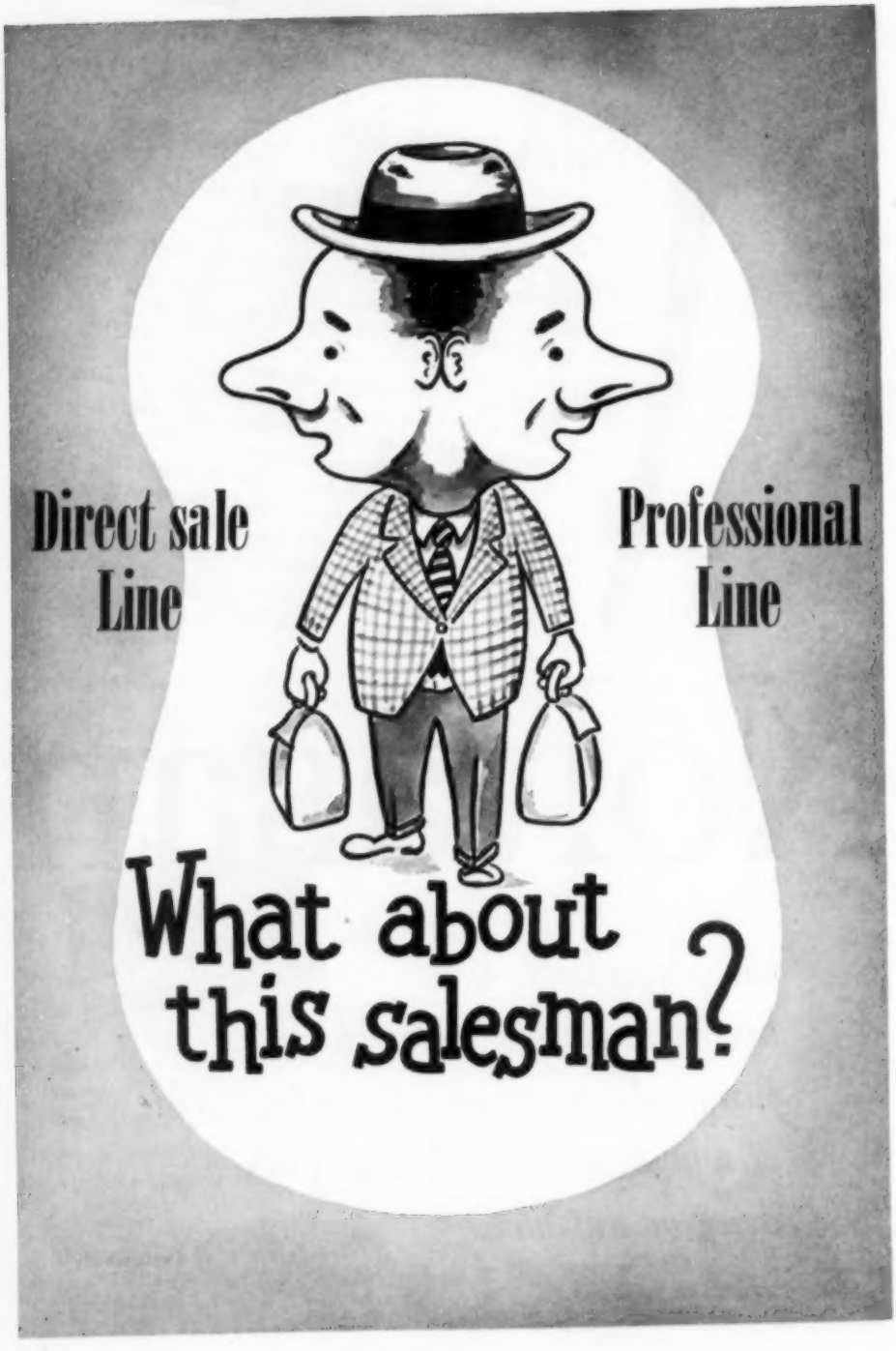
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AVMA ☆ Report

Veterinary Medical Activities

President A. H. Quin was on the program of the summer meeting of the Kentucky Veterinary Medical Association in Louisville on July 20-21.

* * *

The Special Committee on Motion Pictures and Television is sponsoring a Motion Picture Workshop Clinic in connection with the AVMA meeting in Minneapolis.

The Clinic will be held in the Admiral Room of the Radisson Hotel on August 14, from 1:30 to 5:30 p.m.; the following subjects will be presented:

2x2 kodachromes prepared by Armed Forces Institute of Pathology—*Lt. Col. Fred D. Maurer.*

Developing an acceptable film on a limited budget—*Roy Beckman, U.S.D.A.*
Re-editing an old film—*Frank Todd, Agricultural Research Service.*

Preparation and use of a TV package from existing film footage—*C. D. Van Houweling, Agricultural Research Service.*

Visual aids in extension teaching—*C. D. Lee, Ames, Iowa.*
Visual aids and their application in teaching and research—*R. Getty and John Bowne, Ames, Iowa.*

The Committee invites any one interested in the production and editing of films to attend the Workshop Clinic.

* * *

President-Elect Floyd Cross appeared on the program of the API Conference for Veterinarians in Auburn, Ala., on July 24-27.

* * *

H. E. Kingman, Jr., and R. G. Rongren of the AVMA office met with the Local Committee on Arrangements for the 1955 meeting in Minneapolis on June 28 and 29. Dr. Kingman also attended a meeting of the Local Committee on July 18 and 19.

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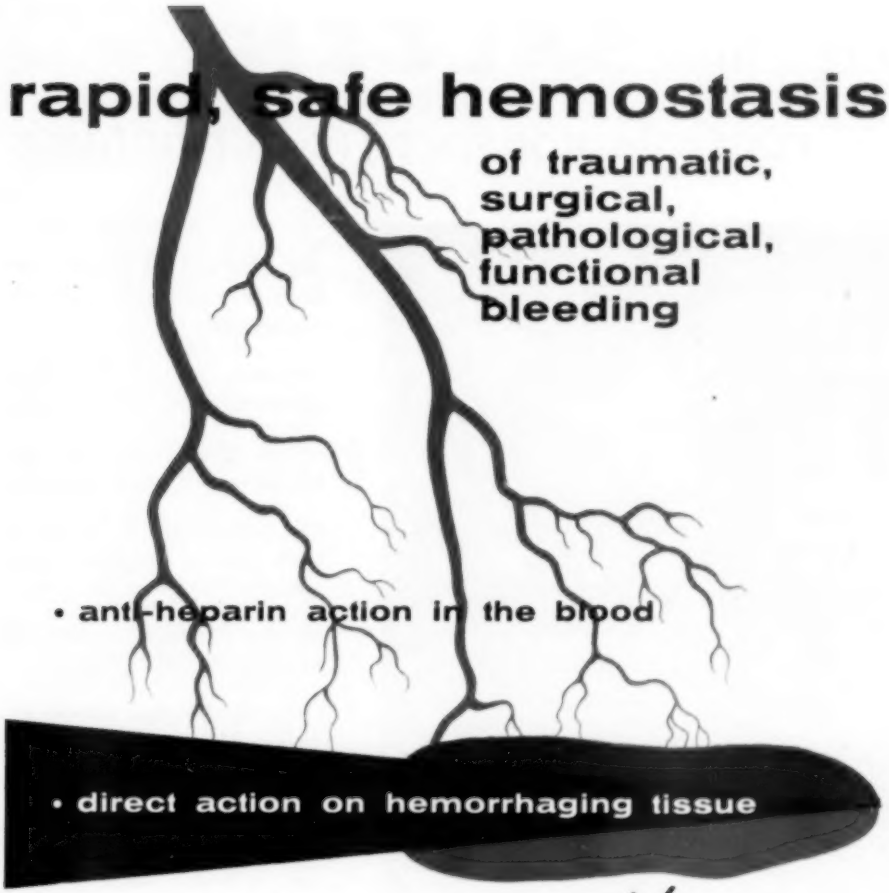

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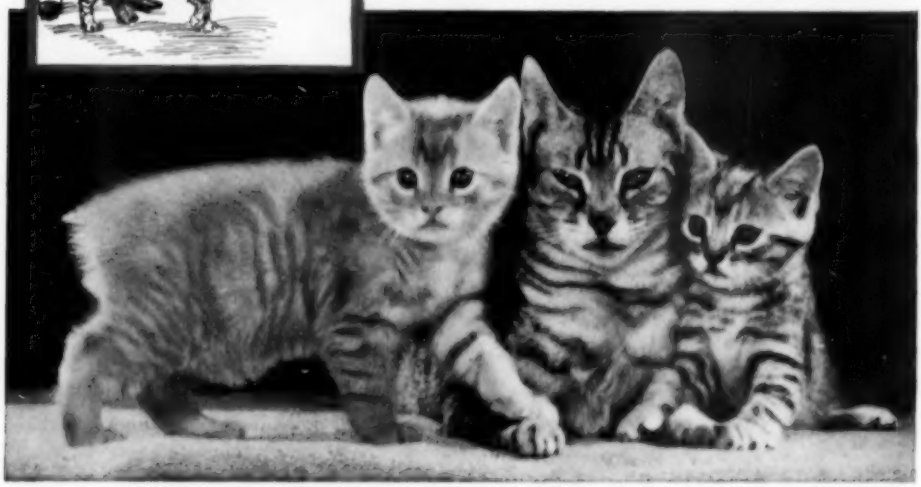

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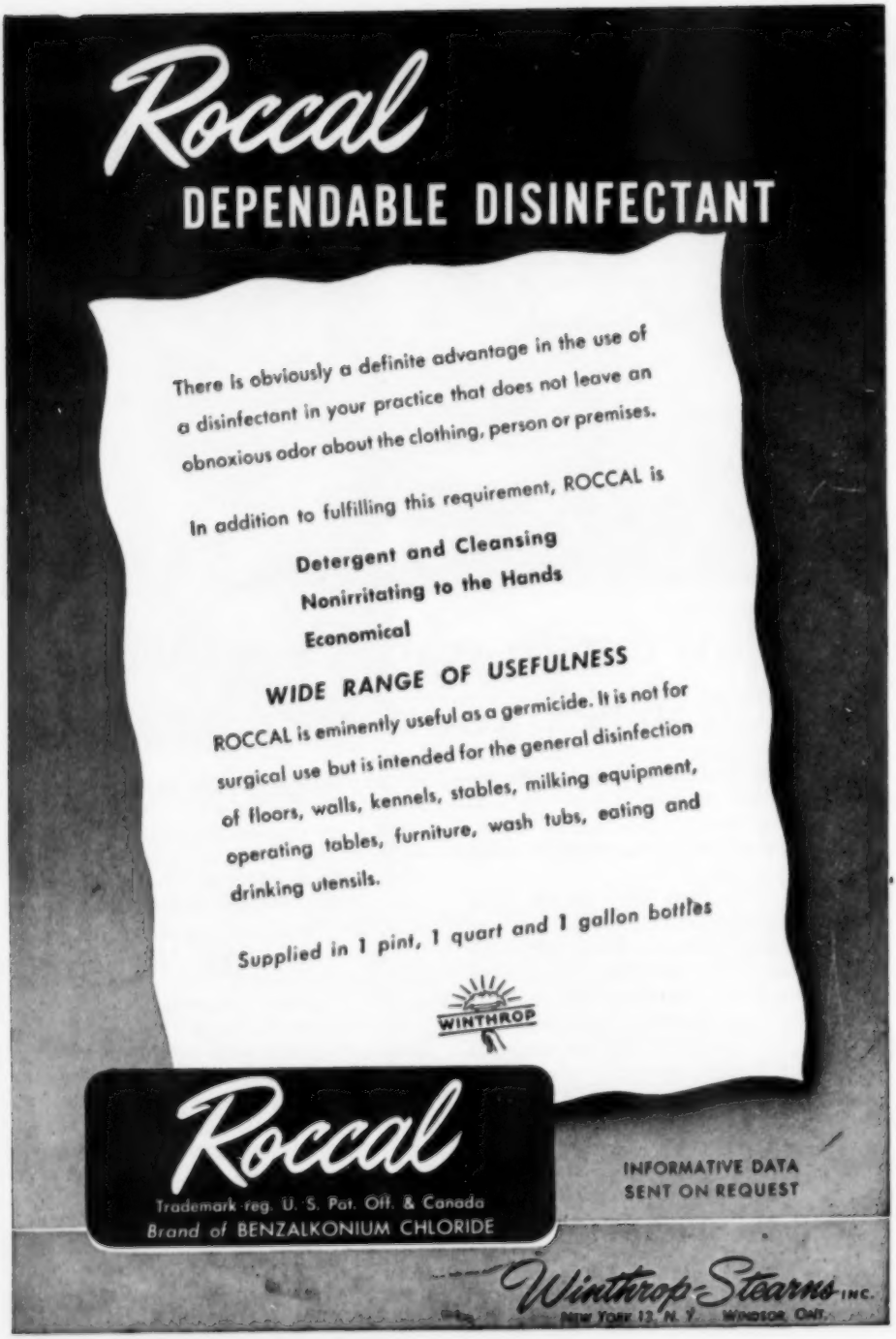
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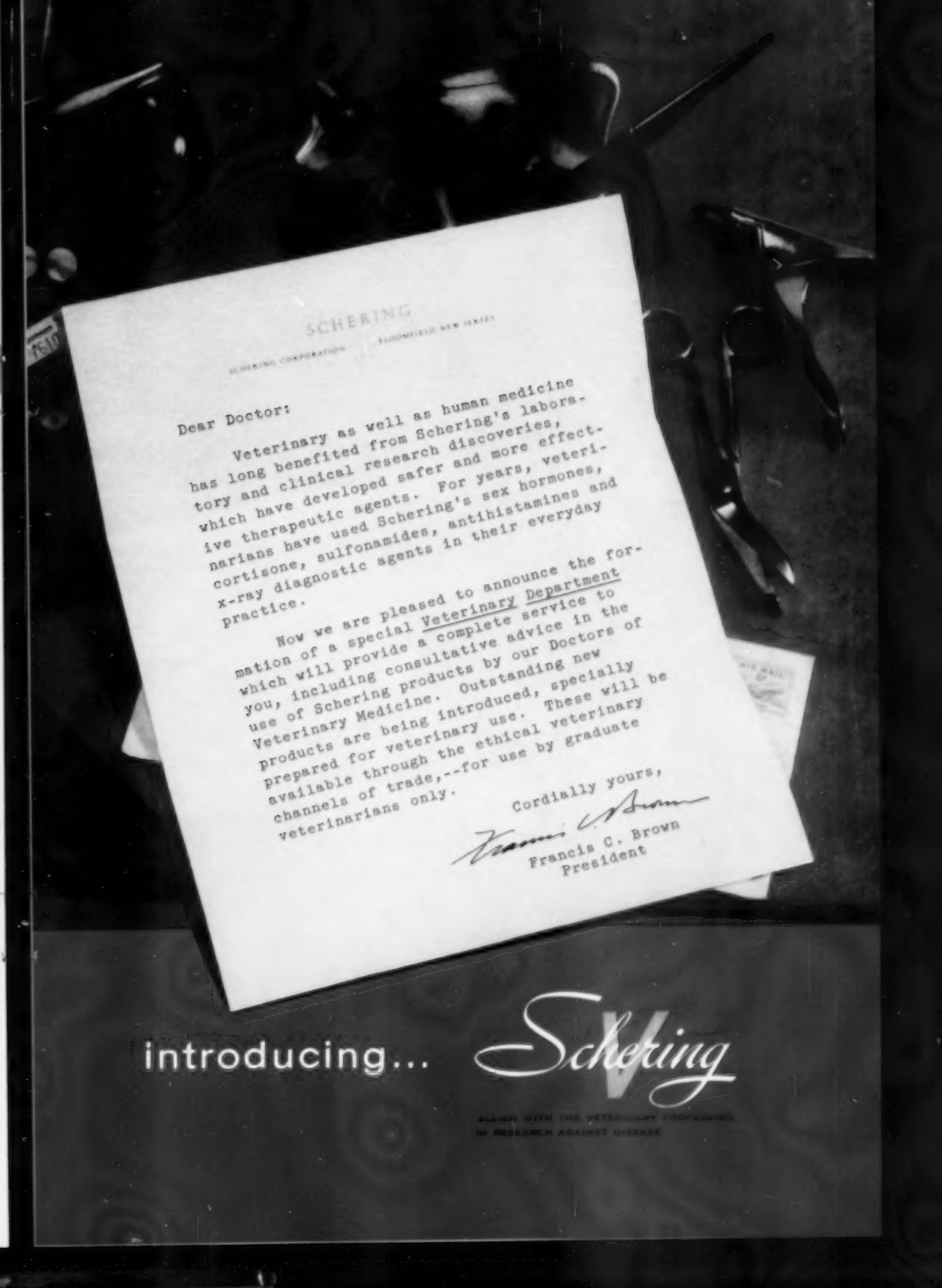
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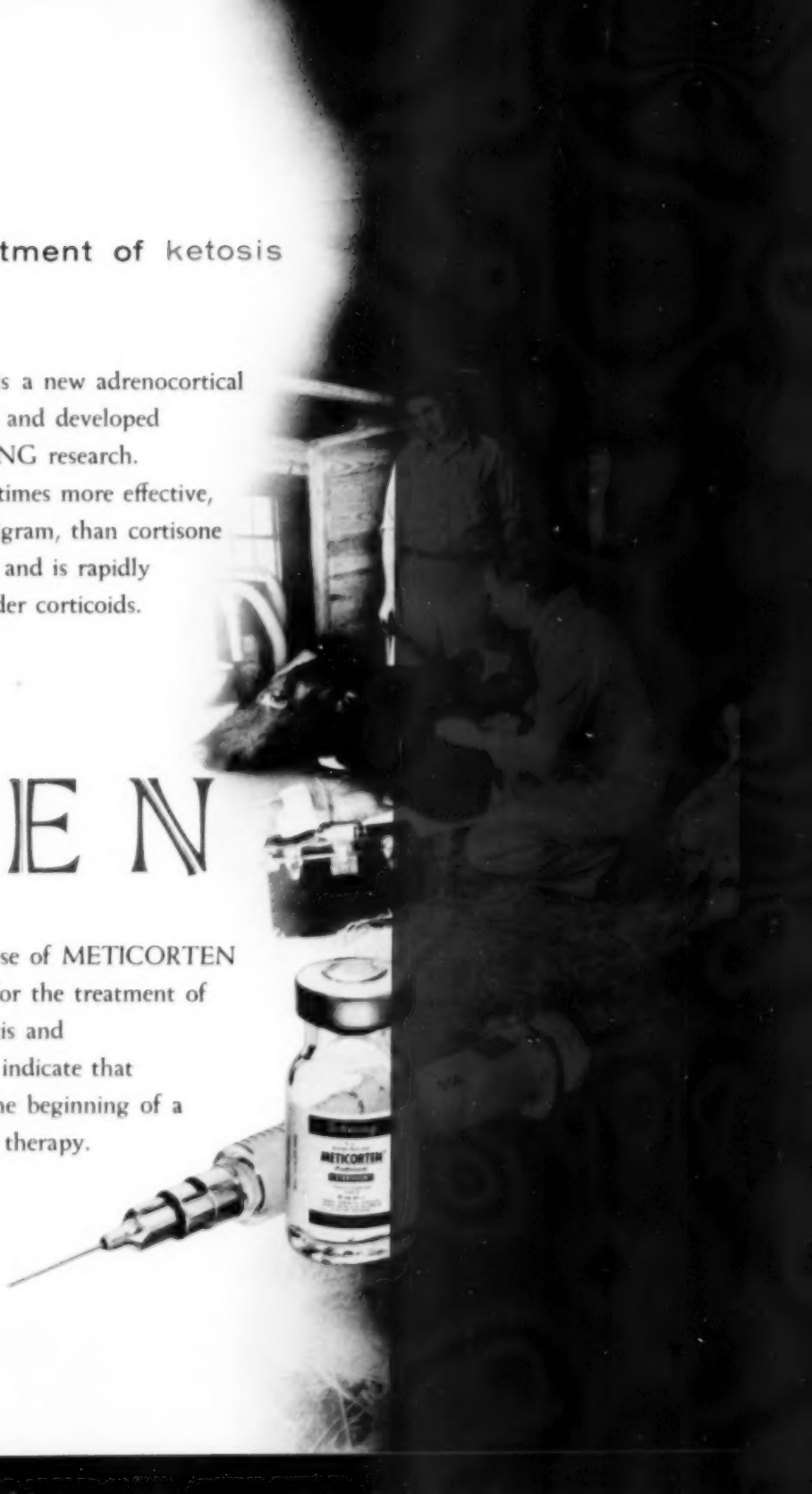

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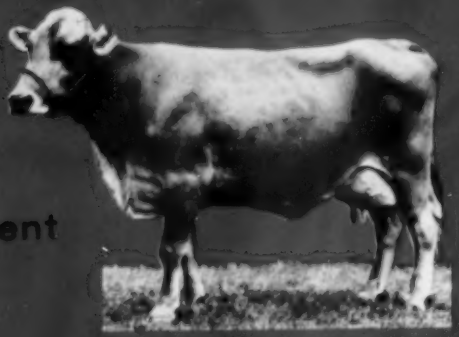

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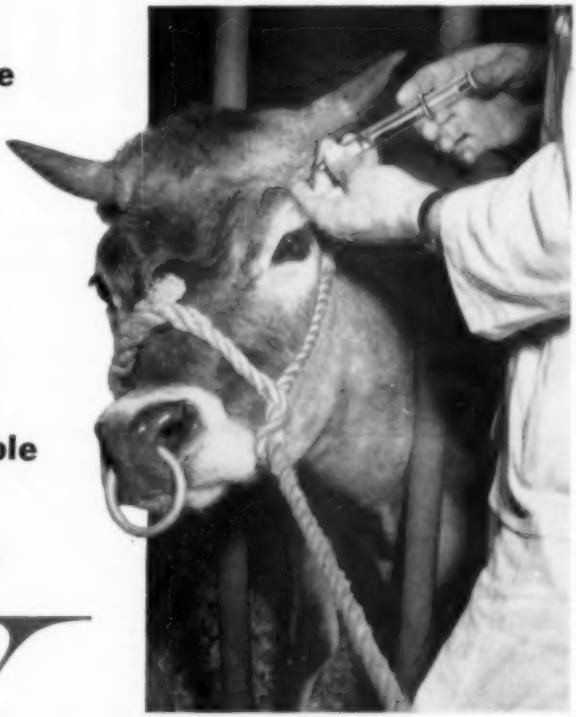

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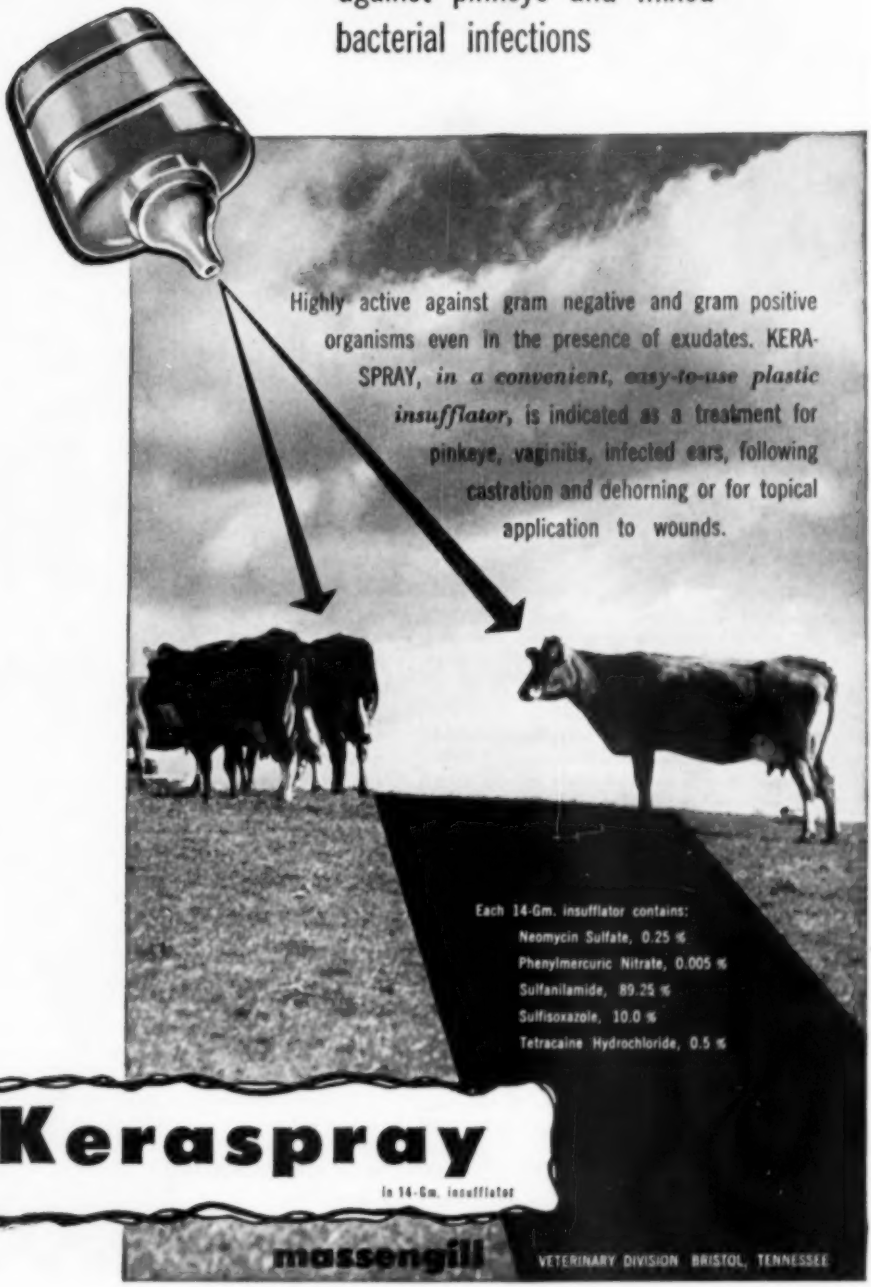
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Journal
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VOL. 127 AUGUST, 1955 No. 941

Evaluation of Some Concepts of Bovine Ketosis from a Practitioner's Standpoint

R. F. VIGUE, D.V.M.

Springvale, Maine

THE OBSERVATIONS herein reported are those of a practitioner. Not being a nutritionist, biochemist, or physiologist, the practitioner has many limitations in the field of research; yet it must be conceded that ketosis remains a practitioner's problem.

There is a voluminous literature on ketosis, some of it intended to explain the mechanism of the disorder, but most of it directed to treatment. Surprisingly little has been written concerning prevention. This report deals with some of the more popular concepts of the condition.

Ketosis has been defined as "a condition in which there is an excessive accumulation of ketone bodies in the blood and tissues."[1] Generally speaking, the production of ketones increases when the quantity of carbohydrate in the metabolic mixture is low, and large proportions of body fat are being burned. For our discussion, ketosis may be classified as follows:

Primary ketosis (spontaneous)	Secondary keotsis (complicated)	True ketosis (spontaneous)
a) Underfeeding	a) Metritis	Due to adrenal insufficiency
b) Overfeeding	b) Mastitis	
	c) Gastritis	
	d) Etc.	

This is not a satisfactory classification since "true spontaneous ketosis," denoting a type originating as a result of primary endocrine failure, is confusing. One can gather from the literature that the only way to properly diagnose this type is by checking its response to ACTH or cortisone. It is claimed that when there is no response to these hormones, it is good evidence we are dealing not with "true ketosis," but with another condition, or with "complications." Some workers have suggested the terms "obvious" and "inobvious" ketosis to denote degrees of the disease.

Dr. Vigue is a general practitioner in Springvale, Maine.

This paper, presented at the Conference for Veterinarians, University of Pennsylvania, Philadelphia, Jan. 4, 1955, is the result of a study which was aided by grants from the Upjohn Company, Kalamazoo, Mich., to Nasson College, Springvale, Maine, where the author is a consultant in research.

This study would not have been possible without the cooperation of the following individuals to whom the author is grateful: Robert M. Wilson, Springvale, Maine; Dr. Robert R. Marshak, Springfield, Vt.; Vinton T. Ridley, Springvale, Maine; Dr. Alan M. Butler, Harvard Medical School and Massachusetts General Hospital, and his staff; Drs. S. F. Scheidy, Sharp & Dohme, West Point, Pa.; R. A. Lemon, Pacific Laboratories, Richmond, Calif.; L. A. Michaud, Merck and Co., Rahway, N. J.; J. L. Davidson, the Upjohn Co., Kalamazoo, Mich.; N. B. Petschulat, La Grange, Ind.; R. E. Ward, Eastern States Cooperative, West Springfield, Mass.; Edward A. Harriman, Park and Pollard Grain Co., Biddeford, Maine; Stanley L. Freeman, Charles M. Cox Co., Malden, Mass.; Richard Shaw, Robert Littlefield, Philip Young, Norman White, Carl White, John Malley, and Lawrence Carpenter, Springvale, Maine; Dr. Coburn DeGoosh, Norway, Maine; Prof. William Fitzgerald, Ronald Deering, Herbert Lourie, Norman Nadeau, and Miss Constance Gauthier, Chemistry Department, Nasson College, Springvale, Maine; Drs. H. A. Keener, F. E. Allen, and N. F. Colovos, University of New Hampshire, Durham; Lt. Col. T. C. Jones and Capt. W. M. Sulliphant, Armed Forces Institute of Pathology, Washington, D. C.; Dr. Joseph E. Porter, Maine General Hospital, Portland, Maine; and last but not least, the dairymen who cooperated so wholeheartedly in the course of the experiment in evaluating the various therapies employed in the treatment of ketosis.

Acknowledgement of the kind assistance of the above individuals is not intended to infer or imply that any of them are in agreement with any part of this article.

MATERIALS AND METHODS

All the animals except those used in evaluating the various therapies were purchased locally from livestock dealers and dairymen.

The dry oxalate mixture described by Ham[7] was used as the blood anticoagulant. Plasma glucose was determined by the method of Folin and Wu.[8] Total plasma ketone was measured by the method suggested by Robertson and Thin.[9] Total serum proteins were determined by the methods of Phillips *et al.*[10] and Greenberg[6]; serum albumin and globulin by the procedure of Greenberg.[6] The methods of Fiske and Subbarow[11] were used in the determinations for serum calcium and inorganic phosphates.

The standard method of Wintrobe[12] was employed in obtaining the hematocrit values; eosinophils were counted according to the recommendations of Randolph,[13] employing his staining technique. The eosinopenic test was conducted according to the suggestions of Thorn[14] using 200 to 250 I.U. of ACTH subcutaneously. The use of epinephrine as an index was not reliable in our hands and this has also been the experience of others.[15] Plasma and blood volumes were determined by the method outlined by Reynolds,[16] employing T-1824 dye.*

The cortisone, hydrocortisone, and ACTH** employed are the same preparations available commercially. Ketogestin was specially prepared by Upjohn Company. The Evans blue dye (T-1824) was experimental preparation No. W761-1 (Warner-Hudnut, Inc.).

SEASONAL INCIDENCE

Any concept of ketosis must explain the great variation in the seasonal incidence of the disease. Over a five-year period in my practice, approximately 190 cases were treated annually. Of these, 81 per cent occurred in the six-month period from November 1 to April 30 (*see* April, 1955, JOURNAL, p. 288, chart 1). This seasonal variation has been reported by a host of others.[17–23] Ketosis does occur in the summer months, but it is definitely reduced during the period that cows are on good pasture. The disease will occur when pastures are inadequate or when the balance of nutritive requirements is not made up by other feedstuffs.[24–26] Some workers[27] have ascribed exercise as one reason why the disease is reduced during the time cows are on pasture, but ketosis has been reported as occurring in pen-stabled herds and in cows on the range.[28–30]

THE NUTRITIVE RATIO

The textbook defines ketosis as "a disease of the well-nourished, high-producing dairy cow."[21,22] Most of the cases I treat occur in good cows which were fat at the time of calving. However, a fat cow, like her human counterpart, is not necessarily well nourished.

About seven years ago, we began keeping histories on every cow treated for ketosis, probing the feeding practices since the last lactation, computing daily requirements for nutrients (using the standards of the National Research Council[23]), and estimating what the cow had received during the entire period, using Morrison tables. Almost without exception, these data revealed that at one place or another the cow had been short-changed nutritionally.

1) Most frequently, the nutritive ratio (digestible protein to calories) was too wide, resulting in the cow getting so fat that she appeared overfed when, according to the feed standards, she was grossly undernourished (short on protein). Consequently, feed allowances were often further reduced. The nutritive ratio is more of a factor in causing fatness than is the plane of nutrition, regardless of species.[24] In other words, a cow can get fat during the dry period with an inadequate protein intake. This was observed repeatedly where poor quality roughage was used with so-called "calving rations."

2) The next most common finding was inadequate feeding right after calving, the period in which cows require increased energy to compensate for their usual weight loss.[25] Some dairymen restricted the feed before calving in an attempt to reduce udder congestion (lymph accumulation), which has been shown to be due not to overfeeding but to improper feeding, *i.e.*, too much energy in relation to protein intake.[26] This practice was often continued after calving in order to "save the udder." The few cows which develop udder congestion regardless of ration should be premilked instead of having their feed reduced abruptly during this critical period.

3) Some dairymen increase the postpartum ration too slowly in relation to milk production. Some cows produced 60 to 70 lb. of milk daily within a week to ten days after calving, yet received feed sufficient to support only half that production. Some feed companies recommend the practice of increasing the feed slowly, allowing up to 60 days before catching up with production. This program is successful if the cow is nutritionally readied for such a regimen. However, our data indicate that a wide margin between dietary intake

*The histopathological examinations were made by Joseph E. Porter, M.D., Maine General Hospital, Portland, unless otherwise indicated.

**The cortisone, hydrocortisone, and ACTH were obtained through the courtesy of Upjohn Co., Kalamazoo, Mich.; Merck and Co., Rahway, N. J.; and Pacific Laboratories, Inc., Richmond, Calif.

and actual requirements developed before this point was reached, and this, coupled with improper feeding during the dry period, resulted in the cow becoming nutritionally bankrupt, and she developed ketosis under such a plan.

4) In less than 2 per cent of the cows with ketosis, the nutritional allowances had exceeded the actual requirements during the dry period. These cows also became very fat and generally went off feed before calving. The mechanism of this is not well understood; however, it has recently been shown that endocrine activity is influenced by the nutritional level and that overfeeding makes the organism sluggish.[37] This may be mediated by the thyroid gland; thus, the paradox of cows getting fat from overfeeding as well as from underfeeding — the former due to overabundance, the latter to an inadequate ration (overfed but undernourished). The nutritive ratio is more important than the plane of nutrition if addition of body fat is the objective, as in fattening steers,[38] but we are dealing with dairy cows.

5) Since our data showed, in practically every instance, some evidence of nutritional shortcomings prior to the development of clinical ketosis, it was concluded that a nutritional defect preceded the impairment in the pituitary-adrenocortical system and that the changes in the endocrine organs were a consequence or a manifestation of this defect rather than its cause.

NUTRITION ASPECTS

Some recent work[38] has shown that a loss in total digestible nutrients occurs in feeds as a result of storing them. The important finding was the marked loss in protein digestibility as a result of prolonged storage, and the further widening of the nutritive ratio when roughages are aged which results in their becoming more fattening.

A gain of weight during the dry period of the dairy cow is desirable but we should take into account the composition of that increase. It would seem more desirable to add a maximum of active tissues (red meat) to the cow's body rather than fat. This does not infer that fat is metabolically inactive. However, it has been proved that the nutritional level affects endocrine activity,[37] that the lean (not underfed) body mass has a more responsive endocrine system,[39-41] and that the fat body mass is associated with decreased thyroid function and a smaller circulatory blood volume[42,43] as well as with hypoactivity of the pituitary-adrenal axis.[40,41,44] Thus, if the lean body mass is metabolically more active than the fat body mass, it should meet "stress situations," such as heavy lactation, more effectively.[45]

It was recently pointed out that body fat and body water are inversely proportional to each other, while active tissue, body water, and blood volume are directly proportional to each other.[24,46,47] The fatter the animal, the less the blood volume per unit of weight. Thus, plasma and blood volumes are more closely correlated with active tissue and body water than with total weight of the animal. The determination of these compartments can presumably be used as one index of nutritional status as well as metabolic condition.[24,42,46-57] That obesity or over-fatness predisposes good animals to ketosis[58-61] is well established, having been proved in carefully controlled experiments.[58,62,63]

It is not our intention to minimize the great importance of energy in the ration of the dairy cow but, rather, to focus attention on the increased suceptibility to ketosis of the dry cow fed a high-calorie, low-protein ration. Ketosis is literally a negative energy balance with oxidation of body fats and proteins to compensate for a high caloric requirement during early lactation. Both protein and calories are important in bovine nutrition and one can not be dissociated from the other. In the high-producing dairy cow, it is doubtful if any research studies showing how poorly we can feed the ruminal bacteria will find much application. No one has questioned the efficiency of the rumen organisms; the problem in the good dairy cow is how we can best feed those organisms to meet their nutritional requirements.

Since body water and blood volume are more closely related to active tissues than to total body weight, and since there is a direct relationship between body water and blood volume, then the volume measurement of either should serve as one criterion of nutritional and metabolic status of the animal. Measurement of total body water is possible but difficult.[39] However, there is a relatively simple and practical method of measuring the total blood volume of the dairy cow.[17,64]

Table 1 shows some of our blood volume determinations. The thin cow, although actually undernourished, has the greater relative volume, but she is not healthier, as this is due to hydration. The hematocrit

is low and there is also a slight hypoproteinemia. The 2 ketotic cows showed lowered blood volumes and higher hematocrits. The reduction in blood volume can not be entirely ascribed to dehydration inasmuch as the concentration of constituents other than glucose and acetone are within normal levels. In other words, if it were simple water loss, the other blood components would show a relative increase.

If we could measure the absolute quantities of some of the other constituents such as calcium, phosphorus, proteins, etc., they would be low when compared with normal plasma and blood volumes. Three ketotic cows, bled at the time of slaughtering at the height of the disease, had estimated blood volumes of less than 75 per cent of their normal counterparts. Thus, the cow severely affected with ketosis is suffering from more than hypoglycemia.

These data illustrate the pitfall of relying too heavily upon any single criterion in determining nutritional status. Too few determinations were made to reach any definite conclusion, but there is some indication that the textbook definition of what constitutes a well-nourished cow may be in need of revision.

The well-nourished cow will freshen in a lean condition with a maximum of active tissues. She is metabolically more active and she can draw more metabolites at the onset of a heavy lactation without depleting herself. However, this state of "nutritional readiness" must not be lost shortly after calving. It is of the utmost importance to keep the cow in positive nutritive balance during this critical postpartum period in which most cases of ketosis develop. Nutritive allowances must be commensurate with the cow's requirements. This is the time when energy deficits are felt the most, since the cow is then forced to burn the fat and protein stores from her body and, if not properly fed, will develop ketosis.

In the case of cows prone to ketosis, an attempt should be made to anticipate the heavier dietary requirements prior to the appearance of a severe energy deficit. The nutritional plane should be on an ascending level before the heavy lactation develops.

THE CONCEPT OF DIETARY INSUFFICIENCY

Ketosis is not strictly a starvation disease. If it were, it would not be difficult to reproduce the disease simply by fasting. "In the chronically underfed the 'fasting ketosis' is usually of brief duration and is present only at the beginning of the fast; there is then a metabolic adjustment and adaptation with disappearance of hypoglycemia, ketonemia, and ketonuria."[65,66]

Two attempts were made to produce ketosis by the sudden reduction of feed during the period in which most clinical cases are seen (chart 1). Two cows were kept tied in stanchions with all the water

TABLE 1—Blood Volume Determinations (Reynolds' Method) of Dry Dairy Cows Employing T-1824 Dye

Cow No.	Breed	Physical condition	Age (yr.)	Wt. (kg.)	Days due to calve	T-1824 used	Month measured	Blood vol. cc./kg.	Postpartum history and comments
1	Jersey	Lean	4	383	10	100 mg.	June	59.3	———
2	Holstein-Friesian	Lean	10	564	16	150 mg.	April	58.7	———
3	Guernsey	Lean	5	409	12	100 mg.	April	61.4	———
4	Jersey	Fat	5	597	18	100 mg.	May	50.5	Rapid weight loss
5	Jersey	Fat	3	363	20	100 mg.	April	46.6	Ketosis 21 days after calving
6	Guernsey	Fat	6	491	14	125 mg.	March	51.8	———
7	Ayrshire	Very fat	8	537	17	150 mg.	March	46.2	Milk fever 14 hours after calving
8	Holstein-Friesian	Very fat	7	589	20	150 mg.	Feb.	43.8	Rapid weight loss
9	Guernsey	Very fat	6	424	19	100 mg.	March	50.2	———
10	Holstein-Friesian	Thin	7	532	13	125 mg.	Feb.	62.2	Retained placenta. Plasma protein 6.2 Gm./100 cc.; hematocrit 28%
11	Guernsey	Thin	5	339	16	100 mg.	June	64.1	Plasma protein 5.8 Gm./100 cc.; hematocrit 26%
12	Jersey	Thin	6	546	+20	100 mg.	March	58.4	Clinical ketosis, hct. 48%; plasma protein 7.8 Gm./100 cc.
13	Ayrshire	Thin	6	445	+14	125 mg.	April	41.2	Clinical ketosis, hct. 47%; plasma protein 7.1 Gm./100 cc.

Fat cows have less blood per unit of weight than lean ones. Very thin (underfed) cows have greater volume but lower hematocrits (hct.) and mild hypoproteinemia which denote hydration. Notice the reduction in blood volumes of ketotic cows.

they wanted, but all edibles were removed. Ketonemia was produced but not hypoglycemia; also, a relative adrenal insufficiency was produced, as indicated by the rise in the circulating eosinophils and the response to the four-hour ACTH test, but no clinical ketosis.

Chart 2 represents a good response in a ketotic cow which was treated with glucose. When this animal was fasted, however, ketosis did recur. A comparison between this cow and the other 2 shows that when the first 2 cows were fasted their milk secretion dropped rapidly, whereas the ketotic cow kept right on producing milk. The first 2 cows adapted themselves, whereas the third one could not.

Genetically, the ketotic cow can not readjust the production of her anterior pituitary hormones rapidly enough to cope with a dietary insufficiency or other stress stimuli by reducing her milk flow. Meta-

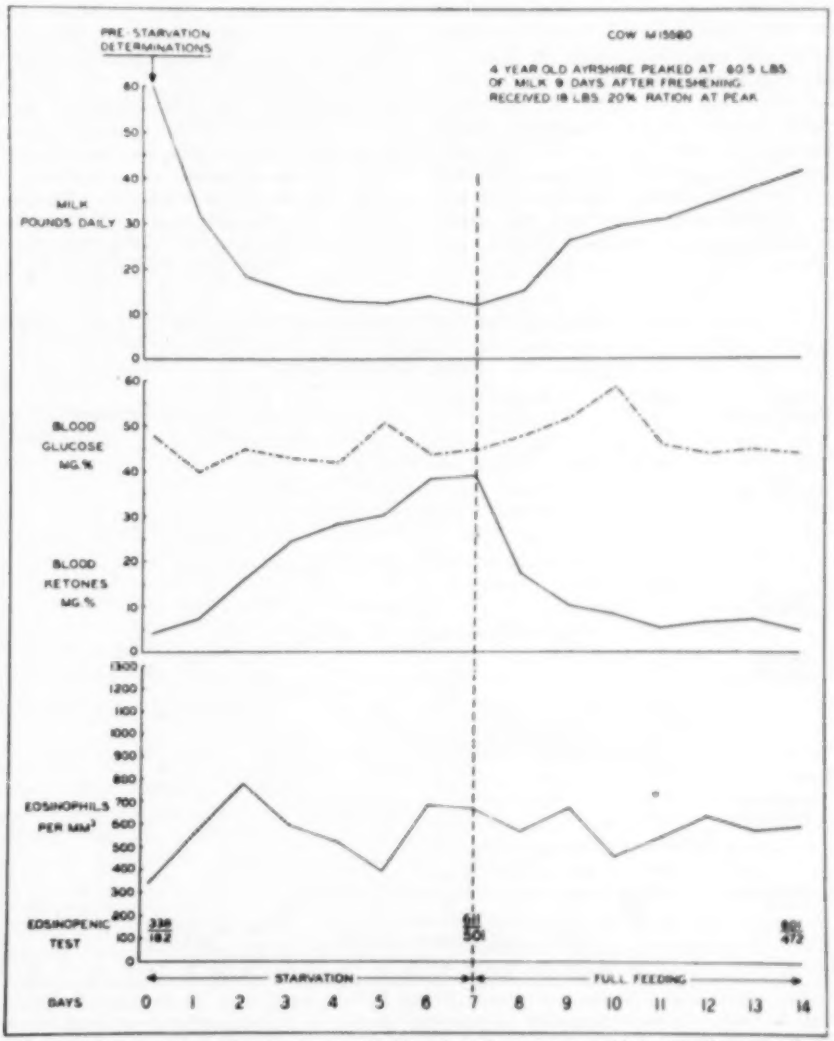
PRE-STARVATION DETERMINATIONS
COW M 15080
4 YEAR OLD AYRSHIRE PEAKED AT 60.5 LBS. OF MILK 9 DAYS AFTER FRESHENING. RECEIVED 18 LBS. 20% RATION AT PEAK
MILK POUNDS DAILY
BLOOD GLUCOSE MG.%
BLOOD KETONES MG.%
EOSINOPHILS PER MM³
EOSINOPENIC TEST
338 182
611 506
STARVATION
FULL FEEDING
DAYS
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

Chart 1—This chart shows the effects of withholding feed from a 4-year-old Ayrshire for seven days.

bolic disturbance (ketosis) is the outcome. "The normal ruminant possesses the ability to adjust promptly to the stress, while the ketotic cow does not; it would seem a much sounder practice to eliminate the stress rather than give assistance in meeting it."[67] This means establishing and maintaining a proper relationship between the cow's ration and her milk production.[68]

THE CONCEPT OF PROTEIN INTOXICATION

About a decade ago, the concept of protein intoxication as an etiological factor in ketosis was advanced.[69,70] It was stated that too much protein resulted in an upset in the ruminal flora. The levels of protein required to produce this were not specified. Too high a level or too abrupt a change to high protein can throw a cow off feed. However, such a ration would be defective with respect to other nutrients (for example, energy) and, therefore, the cause could not be totally ascribed to the protein quota.

The data on our case histories did not reveal excessive protein feeding as an important cause of ketosis. It also is difficult to conceive how parenteral medication could result in such prompt response if ruminal disturbances were a primary factor.

To test the effect of a high-protein ration, 3 good dairy cows were fed an average hay (8% crude protein) and a freshening grain mixture (12% protein). Immediately after calving, they were placed on good leafy alfalfa hay (18% protein) and a grain mixture (24% protein), which were fed *ad libitum* for two months. The hay was not weighed, but the average daily consumption of the grain mixture was 26 lb., the maximum 39 lb. The average milk production during this period was 48 lb. The lactation response was excellent, none of the cows went off feed, they all appeared to be in good health, and their blood sugar and ketone levels remained within the normal range. High protein feeding has also

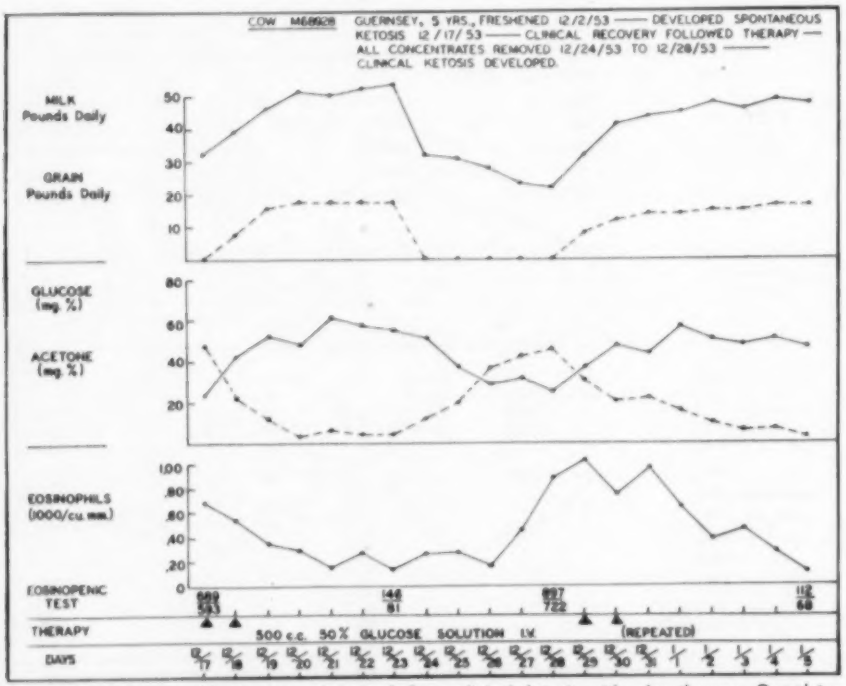
COW M68928 GUERNSEY, 5 YRS., FRESHENED 12/2/53 —— DEVELOPED SPONTANEOUS KETOSIS 12/17/53 —— CLINICAL RECOVERY FOLLOWED THERAPY — ALL CONCENTRATES REMOVED 12/24/53 TO 12/28/53 —— CLINICAL KETOSIS DEVELOPED.
MILK Pounds Daily
GRAIN Pounds Daily
GLUCOSE (mg. %)
ACETONE (mg. %)
EOSINOPHILS (1000/cu. mm.)
EOSINOPENIC TEST
THERAPY
500 c.c. 50% GLUCOSE SOLUTION I.V. (REPEATED)
DAYS

Chart 2—This 5-year-old Guernsey recovered from clinical ketosis with glucotherapy. Complete starvation after the recovery resulted in recurrence. Notice the high level of milk secretion during the starvation period and the quick return to full production following re-treatment, conditions not found in the starved cow (chart 1).

been reported by others[71] as not being detrimental. This discredits the theory of "intestinal autointoxication" which existed at the beginning of the century.[72-74] Also, no one has yet isolated any of these toxins.

In a recent review[13] of ketosis in the dairy cow since the 1920's, the following four important points were among those brought out:

1) There has been a steady increase in the incidence of ketosis[19] which can not be entirely attributed to better diagnostic methods or to the improvement in the dairy cow.

2) There was an increased concern with mastitis about 25 years ago, partly because milking machines were coming into more general use and it was believed that too much protein aggravated the disease.

3) It became fashionable in the dairy feed industry to reduce the protein level from 20 or 24 per cent to 16 per cent, or even to 14, 12, or 10 per cent with a widening in the nutritive ratio which resulted in more fat and a belief that the cows were in better condition.

4) Early work on ketosis indicated that it was due to carbohydrate deficiency and that the best preventive would be high-calorie rations during the dry period. Therefore, so-called "calving rations" containing up to 50 per cent of molasses came into use.

The incidence of ketosis can be reduced by following the simple but sound practice of feeding dairy cows according to the nutritional recommendations of the National Research Council,[53] which were derived from, and slightly increased over, the Morrison feeding standards of 20 years ago to allow for the increased production of the modern cow (*see* April, 1955, JOURNAL, p. 288, chart 2). Others[36] have reduced the incidence from 40 to 2 per cent as a result of correcting feeding practices.

THE CONCEPT OF ADRENOCORTICAL INSUFFICIENCY

There has been wide acceptance[75,76] of the concept that "ketosis in dairy cows is due to an adrenal insufficiency involving the adrenal cortex and the anterior lobe of the pituitary gland."[77,78] True spontaneous ketosis is claimed to result from some functional failure on the part of the pituitary-adrenocortical system, while secondary ketosis is said to result from other stress (complicating) factors. This may be an oversimplification of the facts. Evidence advanced in support of this theory includes gross and microscopic changes which occur in the pituitary and adrenal cortices of ketotic cows. These changes are said to be similar to those found in animals which have been subjected to experimental stress.[79] Since the stress agents used by Selye[80] to elicit the "general adaptation syndrome" preceded the changes in the endocrine organs, these findings do not support a concept that the cause of primary ketosis is a functional impairment of the pituitary-adrenocortical system. In other words, the changes in the endocrine organs are secondary to stress, not the primary causative factor.[40]

Table 2 illustrates the pathological changes in the adrenal cortex found in this practice in various disease conditions. These changes, and those in the anterior pituitary gland, appear to be a fundamental part of the cow's response to all kinds of stress. The factors determining the degree of changes are severity and duration of the offending agent. However, our cows with ketosis showed few changes.

It has been reported that the changes in the adrenal cortex appear to be a physiological compensation resulting from depletion of available lipids; hypertrophy, resulting from sustained and increased production of ACTH by the pituitary gland; or hemorrhagic and necrotic changes as a result of exhaustion due to the failure of the hormones to meet extraordinarily heavy demands. In other words, the changes or dysfunction of the glands follow the stress and do not initiate it.[40,81-92]

Attempts to produce ketosis as a result of pituitary-adrenocortical deficiency have been unsuccessful. It has been shown that neither hypophysectomized[93] nor adrenalectomized[94] animals are peculiarly susceptible to ketosis.

Also, if ketosis were due primarily to an endocrine insufficiency, it is difficult to conceive how we should expect recovery with a single treatment. Apart from the small amounts which may be held in the endocrine organs themselves, hormones are not stored in the body. Therefore, in cases of endocrine insufficiency, repeated small doses rather than a large single dose would be required.[95] And, if functional impairment, *per se*, were responsible, it is difficult to conceive how therapies employing additional stresses could be used to obtain recovery.[22,82,96]

Furthermore, it is known that there is a physiological hypertrophy and an accelerated activity of the pituitary gland, adrenal cortices, pancreas, etc., concomitant with pregnancy in all animal species.[97] Caution must, therefore, be employed before incriminating such changes as being the cause of disease.

In support of the claim that an endocrine dysfunction is the cause of ketosis, it has been reported that if a cow suffers one attack she is almost certain to have a recurrence in subsequent lactations.[98,99] In my opinion, it is doubtful if this is due to constitutional weakness, or because the first attack has left the cow more susceptible. It is more likely that the same etiological factors, such as improper feeding practices, are repeated.

TABLE 2—Histopathological Changes in the Adrenal Cortices of Cows Affected with Various Disease Conditions. The Changes are Nonspecific to Any Particular Type of Stress. Severity and Duration of the Stress Are the Factors Determining the Degree of Pathological Changes

A.F.I.P. Acc. No.	Disease	S or F*	Histopathological findings
	METABOLIC		
641066	Ketosis	S	No significant lesions
655226	Ketosis	S	Inflammation of cortex
652615	Milk fever	S	Inflammation of cortex
653229	Milk fever	S	Congestion with moderate lipid depletion
646954	Ketosis	S	Inflammation, no depletion
653228	Grass tetany	S	Inflammation with lipid depletion
655224	Milk fever	S	No significant lesions
663025	Ketosis	S	Focal necrosis
	METABOLIC ASSOCIATED WITH INFECTIONS		
652614	Ketosis with metritis	S	No significant lesions
646953	Ketosis with metritis	S	Lipid depletion
604546	Milk fever with gangrenous mastitis	S	Congestion, lipid depletion
646952	Ketosis with metritis	S	Inflammation
	INFECTIONS		
594621	Septic mastitis	S	Hypertrophy
625140	Tetanus	S	Cortical hemorrhages
589725	Traumatic gastritis	S	Cortical hemorrhages
604543	Metritis & peritonitis	F	Lipid depletion-necrosis
604544	Brucellosis with abortion	S	Decrease of lipids
663406	Pneumonia	F	No significant lesions
646955	Scours	F	Petechial hemorrhages
598405	Mastitis	S	Inflammation
647747	Pyelonephritis	S	Inflammation
582390	Mastitis	S	No significant lesions
	TRAUMATIC		
645591	Fractured pelvis	S	Lipid depletion
589725	Traumatic gastritis	S	Cortical hemorrhages
655225	Fatal hemorrhage	F	Inflammation
604545	Fractured pelvis	S	No significant lesions
	TOXIC		
604547	Plant poisoning	F	Inflammation
658070	Arsenic poisoning	F	No significant lesions
646950	Lead poisoning	S	No significant lesions

*S = slaughtered; F = fatal.

The metabolic response to ACTH and cortisone in the ketotic cow has been used as evidence in support of the concept that the disease is due to adrenal insufficiency.[77,100] However, there is evidence that an excess of adrenal hormone produces a characteristic glyconeogenic reaction regardless of the stress[87,88] and that this phenomenon also occurs when the hormones are administered to normal animals.[89,101,102] The level of blood sugar is dependent upon many factors other than pituitary-adrenocortical activity.[103]

Pioneers in the physiology of the adrenal cortex have concluded that ACTH and the hormones of its target organ, the adrenal cortex, play a supporting role, not a prepotent regulatory role, in metabolic adjustments.[90,101] "The apparent relationship of adrenal cortical function to the manifestation of certain diseases is based upon a role of essentiality for the cortical hormones, rather than representing primary causative agents."[104]

The concept of adrenal insufficiency can be proved inasmuch as a relative adrenal insufficiency can be easily produced experimentally either by repeated large injections of ACTH which will produce hypertrophy and exhaustion of the adrenal cortices,[105-107] or by the prolonged use of cortisone in large doses which will result in atrophy of the adrenal cortices.[104,108,109] Adrenocortical function can be estimated by employing the four-hour adrenocorticotropin test (based on activation of the adrenal cortex), using changes in the number of circulating eosinophils to measure the adrenal cortical response.[10]

One cow (163), which received 1,000 I.U. of ACTH daily for 16 days (chart 3), ate well on pasture but refused grain on several occasions, and her weight decreased from 987 to 858 lb. Hyperglycemia and slight ketonemia occurred, but the acetone odor could not be detected on her breath or milk, although the urine test was slightly positive. After stopping the hormone injection, there was a marked eosinophilia

and the eosinopenic test indicated adrenocortical insufficiency. Figure 1 shows a section of her adrenal cortex.

A second cow received 1.5 Gm. of cortisone daily for 15 days (chart 4) and a third cow M63126 received 2.0 Gm. daily for two weeks (chart 5). Their appetites remained excellent but they showed weight loss, decrease in milk production, hyperglycemia, slight ketonemia, and eosinopenia during the hormone administration, followed by eosinophilia after hormone cessation. The eosinophil test (4-hour ACTH test) indicated adrenal insufficiency. If the additional stress of heavy lactation had been present in either cow, ketosis presumably would have developed. Histopathological examination of the adrenal cortices of both animals showed lipid depletion and a degree of atrophy (fig. 2) much greater than the cow with spontaneous ketosis which was slaughtered when the condition was well established clinically (fig. 3).

Although too few experiments were conducted to be conclusive, this shows that a relative adrenal insufficiency can be produced without causing ketosis, so it would seem that the burden of proof lies with the protagonists of the adrenal-insufficiency hypothesis.

EVALUATION OF VARIOUS TREATMENTS FOR KETOSIS

Ketosis has become known as the disease of "numerous specifics," because of favorable reports on so many treatments. A number of conditions influence the evaluation of the ketotic cow's response to any therapy, there being: (1) no way of measuring the cow's own recuperative power;

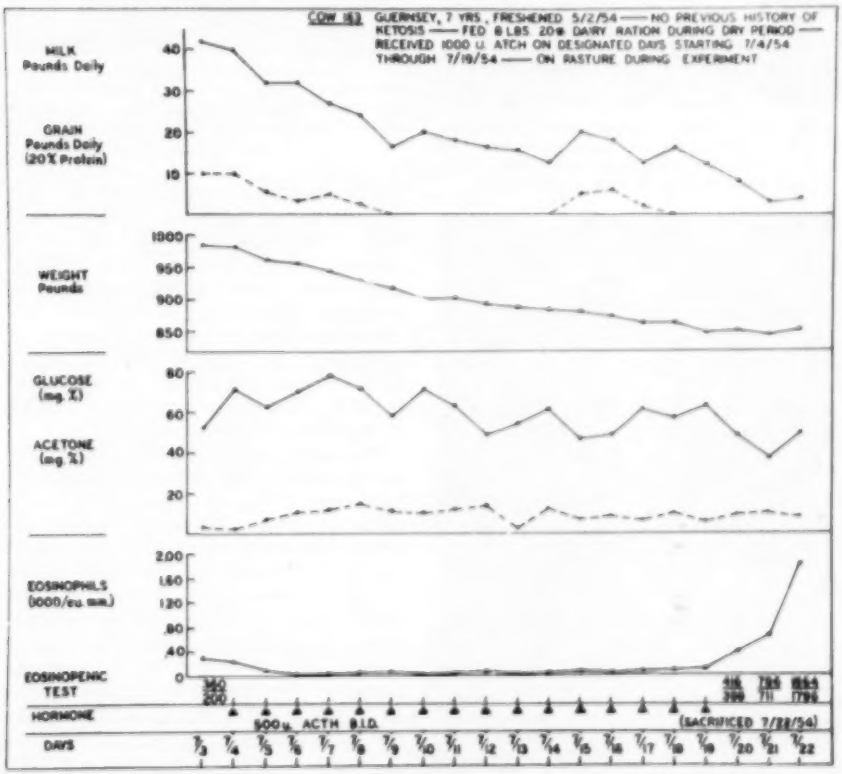
COW 163 GUERNSEY, 7 YRS., FRESHENED 5/2/54 — NO PREVIOUS HISTORY OF KETOSIS — FED 8 LBS. 20% DAIRY RATION DURING DRY PERIOD — RECEIVED 1000 U. ATCH ON DESIGNATED DAYS STARTING 7/4/54 THROUGH 7/19/54 — ON PASTURE DURING EXPERIMENT
MILK Pounds Daily
GRAIN Pounds Daily (20% Protein)
WEIGHT Pounds
GLUCOSE (mg. %)
ACETONE (mg. %)
EOSINOPHILS (000/cu. mm.)
EOSINOPENIC TEST
HORMONE
500 u. ACTH B.I.D.
(SACRIFICED 7/22/54)
DAYS

Chart 3—This chart shows the results of an attempt to produce a degree of adrenocortical dysfunction by prolonged dosage with ACTH. The rise in circulating eosinophils and the results of the eosinopenic tests indicated that a relative degree of adrenocortical insufficiency was induced but not until after cessation of the hormone injections. However, ketosis did not occur.

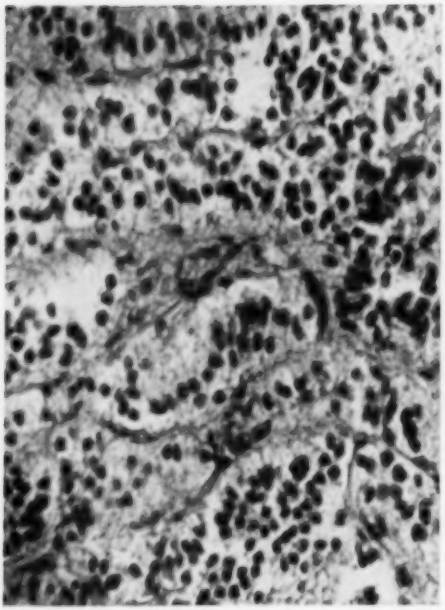

Fig. 1—Section of adrenal cortex from cow 163. The pathologist's report indicated gross enlargement of the gland with nodular hyperplasia, focal hemorrhages, and some degree of lipid depletion.

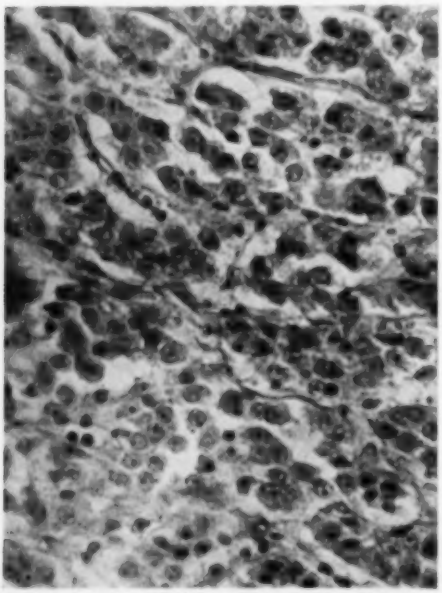

Fig. 2—Section of the adrenal cortex from cow M63126. The pathologist's report indicated atrophy, marked lipid depletion, and focal necrosis.

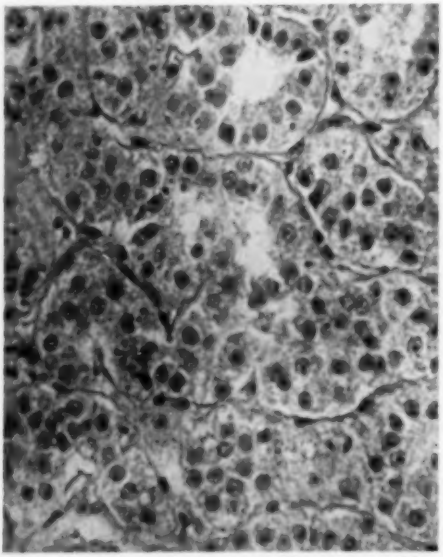

Fig. 3—Section of adrenal cortex from a cow with a field case of primary ketosis slaughtered at the height of clinical manifestations. The histopathological changes were limited to focal congestion and moderate lipid depletion.

(2) no method of determining the severity or duration of the illness; and (3) few controls to indicate the value of any given therapy. There is not much ground for dogmatism regarding the specificity of any particular treatment. In the field, no one treatment results in the recovery of all animals. It is amazing that so many different treatments, some diametrically opposed to others, are successful in the hands of experienced clinicians.

The cows treated in this study were encountered in the writer's practice during 1952 and 1953. Excluded from the study were all cows (1) which showed a total white blood cell count exceeding 14,000 at the initial bleeding; (2) those which developed leukocytosis during the experiment; and (3) those which showed evidence of any other disease. A considerable number of cows had to be excluded because of insufficient owner cooperation. It is difficult to maintain client interest in an experiment of this nature. The repeated venipunctures for evaluating a given therapy were the main objection, especially when continued after the animal had made an apparent clinical recovery.

The following ten different treatments were evaluated: (1) glucose, intravenously; (2) glycerol (glycerin), orally; (3) sodium propionate, orally; (4) cessation of milking; (5) negative controls (placebos, exercise, special palatable feeds, etc.); (6) ammonium lactate, orally; (7) potassium chlorate, orally; (8) ACTH; (9) cortisone; and (10) ketogestin, parenterally and orally.

The treatment to be employed in each case was selected at random until each had been used once, then this procedure was repeated. We had hoped to treat 10 animals with each method, but this was not achieved in every instance. However, this provided a fair representation of field cases.

RESULTS* AND DISCUSSION

1) *Glucose, Intravenously.*—Of 10 cows treated with 50 per cent glucose in 500-cc. doses, 4 recovered after one dose (chart 6), 2 after up to three daily doses, and 4 required other therapy.

Glucotherapy would have been more successful if employed by the drip method, combined with oral supplementation, but we wished to determine the efficiency of a single glucose injection alone.

About a decade ago,[110] beneficial results were claimed from the addition of cobalt to the glucose solution, and with no research whatsoever, some respected supply houses marketed this mixture as a great improvement. A few years later, cobalt was shown to have no effect parenterally, acting only within the rumen.

Glucose remains the most economical, and possibly the most efficient, initial therapy but more than one injection is usually

*See the April, 1955, JOURNAL, p. 289, table 1, showing results of ten different treatments on ketotic cows.

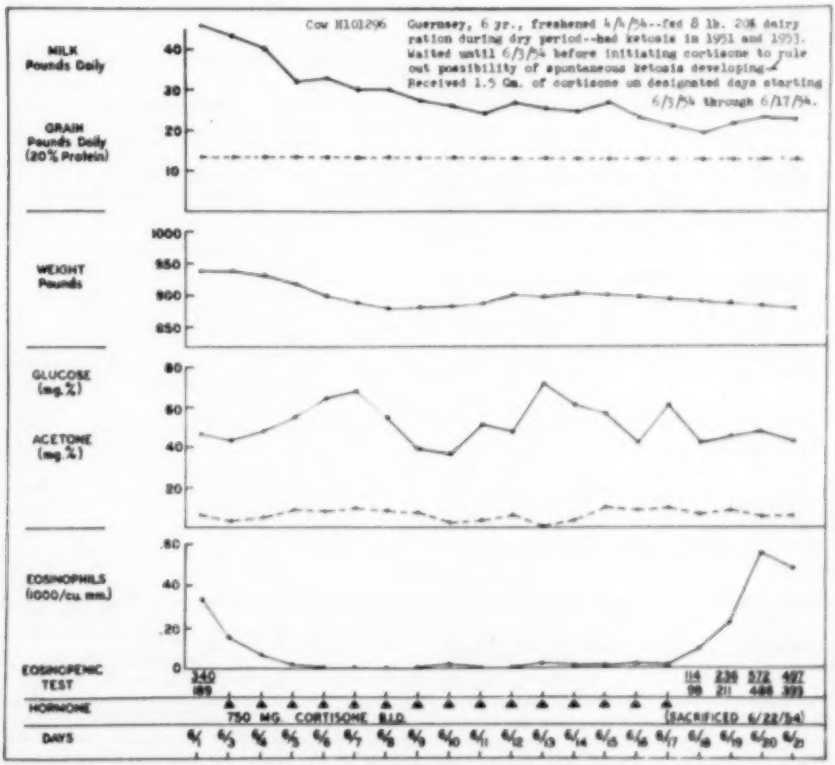
Cow H101296 Guernsey, 6 yr., freshened 4/A/54--fed 8 lb. 20% dairy ration during dry period--had ketosis in 1951 and 1953. Waited until 6/3/54 before initiating cortisone to rule out possibility of spontaneous ketosis developing. Received 1.5 Gm. of cortisone on designated days starting 6/3/54 through 6/17/54.
MILK Pounds Daily
GRAIN Pounds Daily (20% Protein)
WEIGHT Pounds
GLUCOSE (mg.%)
ACETONE (mg.%)
EOSINOPHILS (1000/cu. mm.)
EOSINOPENIC TEST
340 189
114 99
236 211
372 488
497 393
HORMONE
750 MG CORTISONE B.I.D.
(SACRIFICED 6/22/54)
DAYS
6/1 6/2 6/3 6/4 6/5 6/6 6/7 6/8 6/9 6/10 6/11 6/12 6/13 6/14 6/15 6/16 6/17 6/18 6/19 6/20 6/21

Chart 4—This cow received 1.5 Gm. of cortisone daily for 15 days. The rise in circulating eosinophils and results of the eosinopenic tests following withdrawal of the hormone indicated a state of relative adrenocortical insufficiency had been produced but ketosis did not occur.

required. Severe cases respond best to the slow drip method, especially when combined with ACTH or hydrocortisone in the solution. An initial dose of glucose followed by glycogenic substances such as propylene glycol, glycerin, sodium propionate, cane sugar, etc., has been reported to be successful.

2) *Glycerol.*—Of 8 cows given 500 Gm. of glycerin orally twice daily, 4, including 1 only mildly affected, recovered after three days and 4 required other therapy. As an adjunct to other therapy, glycerol might be more efficacious. Excellent results have been reported with doses ranging from 225 to 3,500 Gm.[67,111]

3) *Sodium Propionate.*—Of 11 cows given 4 oz. of sodium propionate[79,112-114] twice daily, 7 recovered (chart 7). A few, however, developed severe diarrhea so this therapy had to be discontinued for them. It has been used as a preventive with some good[19,115] and some disappointing[111] results. Dairy feeds containing sodium propionate are available, but, unless basic feeding faults are corrected, their effectiveness in preventing ketosis is doubted. These feeds may have introduced an era of medicated feed for dairy cows such as there is for poultry. (Much of this can be attributed to the feeling that our responsibility is ended when we have dribbled a bottle of

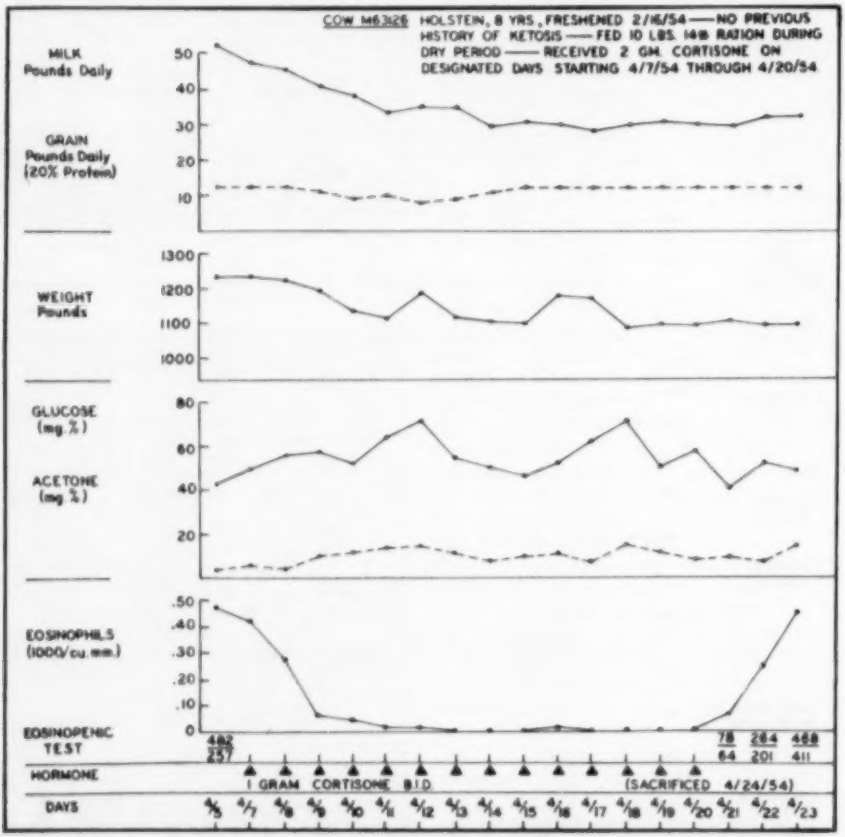
COW M6326 HOLSTEIN, 8 YRS., FRESHENED 2/16/54 — NO PREVIOUS HISTORY OF KETOSIS — FED 10 LBS. 14% RATION DURING DRY PERIOD — RECEIVED 2 GM. CORTISONE ON DESIGNATED DAYS STARTING 4/7/54 THROUGH 4/20/54
MILK Pounds Daily
GRAIN Pounds Daily (20% Protein)
WEIGHT Pounds
GLUCOSE (mg. %)
ACETONE (mg. %)
EOSINOPHILS (1000/cu. mm.)
EOSINOPENIC TEST
482 257
78 64
264 201
468 411
HORMONE
1 GRAM CORTISONE BID
(SACRIFICED 4/24/54)
DAYS
4/5 4/7 4/8 4/9 4/10 4/11 4/12 4/13 4/14 4/15 4/16 4/17 4/18 4/19 4/20 4/21 4/22 4/23

Chart 5—Results of an attempt to produce adrenocortical insufficiency brought about by replacement therapy. The rise in circulating eosinophils and the four-hour ACTH tests at the end of the hormone injections indicated that the adrenal cortices of this cow were not very responsive to exogenous corticotropin, showing that a relative state of adrenocortical insufficiency resulted. Ketosis could not be produced in this manner.

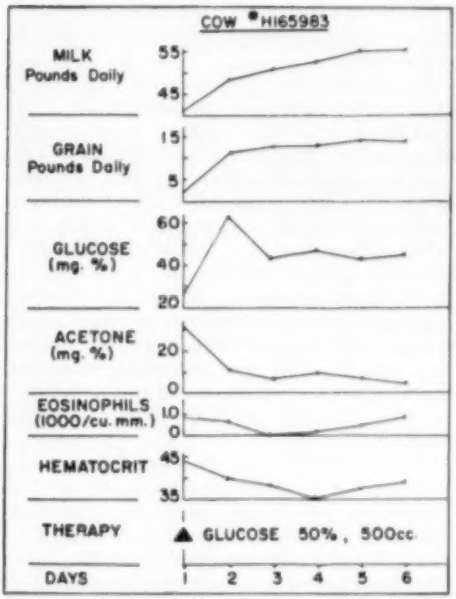

Chart 6—This illustrates an excellent response to a single injection of glucose which is still the most effective therapy for ketosis, especially when administered slowly over a long period.

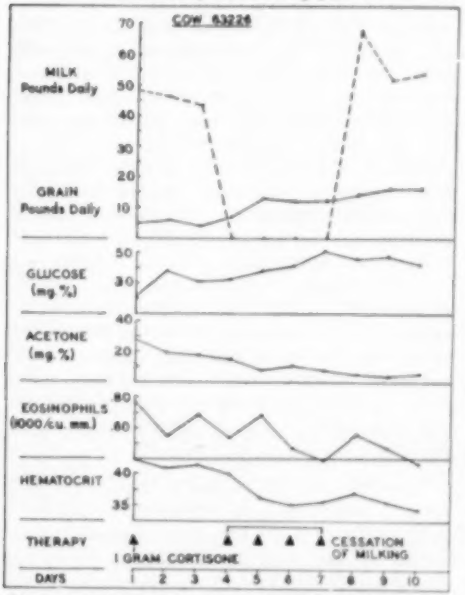

Chart 8—Effects of cessation of milking. This method temporarily removed the stress of lactation which is responsible for the greater part of the metabolic requirements. Notice failure of a single dose of cortisone to produce recovery.

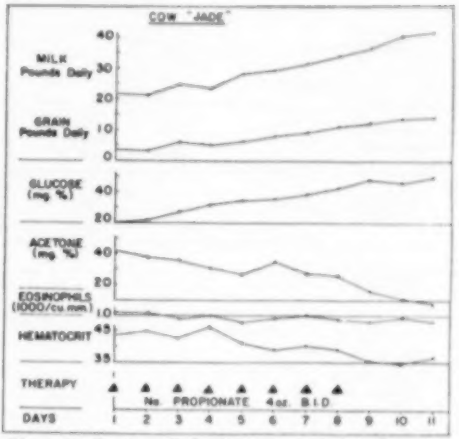

Chart 7—Results of feeding cow "Jade" (1 of 7 of a total of 11 treated which recovered) sodium propionate for eight days.

glucose into a ketotic cow. We feed her by vein yet are not thinking in terms of nutrition.)

4) *Cessation of Milking.*—We were able to persuade only three dairymen to let their ketotic cows go without milking, but we felt that it definitely helped each case. One of these cows (chart 8) had failed to respond to cortisone given three days previously. One cow was left with a "meaty" udder but it was negative for bacteria. Some milk was leaked. Some British clinicians report good results.[103,111] However, since it might incite mastitis, nonmilking probably will seldom be used except as an adjunct to other therapy in refractory cases.

5) *Use of Special Feeds.*—Of 7 cows given no treatment except a special grain mixture candied for palatability, 3 made slow but consistent improvement and recoveries. Persistent anorexia prevented a test of this therapy in the other 4 cows. This is only supportive therapy but the improvement of 3 cows focuses attention on the nutritional aspect of ketosis. Another cow recovered when placed on good pasture for six days (chart 9). Where does the "stress" go to in such cases?

6) *Ammonium Lactate.*—Only 2 of 8 cows, both with mild cases of ketosis, responded satisfactorily to 4-oz. oral doses of ammonium lactate twice a day for five days. Good results, from the Netherlands,

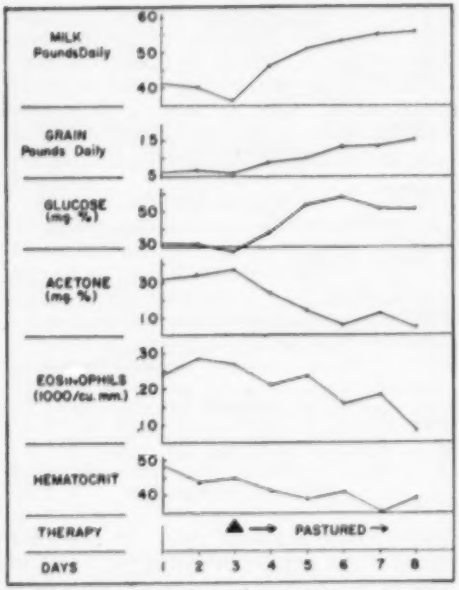

Chart 9—This chart shows the spontaneous recovery of an Ayrshire from ketosis after she was placed on good pasture for several days.

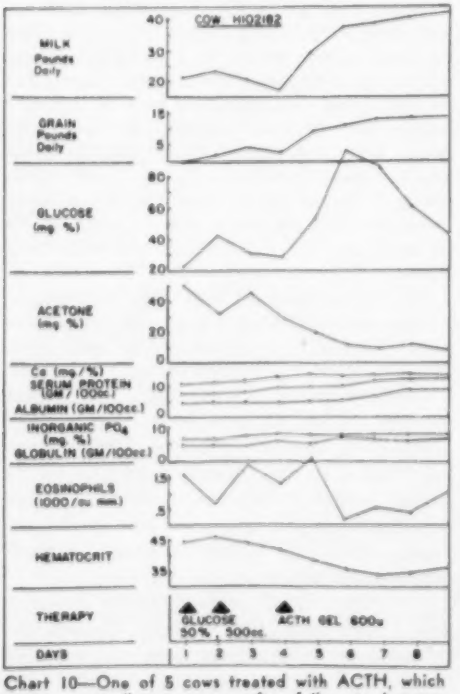

Chart 10—One of 5 cows treated with ACTH, which made an excellent recovery after failure to improve with glucose.

have been reported[116] following a dose of glucose intravenously. Others[25] have found it worthless.

7) *Potassium Chlorate.*—Of 7 cows treated, 3 responded satisfactorily to daily oral doses of 50 to 70 Gm. of potassium chlorate for three to five days. This therapy was reported of value in the Netherlands.[18,27] Low potassium blood values have been reported in ketosis but this has not been substantiated by others.[112] The importance of electrolytes in carbohydrate metabolism is well established.[117] A normal concentration of potassium is essential to obtain sufficient glycogen formation by the cell, and when the concentration of potassium within the cell is decreased, the ability of the liver to take up glucose is lowered.[118-120]

Interestingly, the advocates of this treatment do not attribute its value to the potassium but to its "toxicity" which is reported to result in further stimulating the pituitary-adrenocortical system and, like exercise, acts as a stress factor. This is not compatible with the concepts of adrenal exhaustion. At best, this therapy would appear to be aimed at just one of the many manifestations of the disease.

8) *ACTH.*—Of 10 cows treated with 600 I.U. of ACTH gel intramuscularly, 5 made excellent recoveries (chart 10), 2 required re-treatment within 48 hours, and 3 did not respond after five daily injections (400-I.U. doses used after initial dose).

ACTH represents stimulatory therapy, while cortisone represents replacement therapy. ACTH stimulates the adrenal cortex to produce the so-called "S" (protein-carbohydrate) hormones.

9) *Cortisone.*—Of 10 cows given 1 Gm. of cortisone acetate intramuscularly, 6 responded to one dose (chart 11), 2 responded to up to four repeated daily doses, and 2 required other therapy (chart 12).

10) *Ketogestin.*—Of 10 cows in this series (and 31 in another study), which were treated with ketogestin,* about 50 per cent responded favorably. Some reports on the use of ketogestin, a cortisone-related hormone said to have the glyconeogenic properties of the present hormone without its other activities, have been promising.[116,123] However, our results were not as good as with ACTH, cortisone, and hydrocortisone.

*Supplied by Upjohn Co., Kalamazoo, Mich., but not released for veterinary use.

HORMONE THERAPY

Since ACTH and the cortisones have essentially the same effects on ketosis, they are discussed together. The so-called "S" hormones (glyconeogenic), secreted by the adrenal cortex, influence the conversion of protein and fat to glucose. This latter process is essential for maintenance of normal stores of liver glycogen, especially in periods of inanition. With an excess of these hormones, it would seem logical to provide good nutrition, parenteral or oral, to compensate for their accelerated action. Their catabolic effects have been demonstrated in the normal animal and can be employed to produce ketosis.[92]

Some of the beneficial effects of these hormones must be attributed to their ability to restore normal physiological processes.[86,122]

It has been stated that ACTH and the cortisones are so specific in the treatment of ketosis that "cows which do not exhibit a good response either do not have spontaneous ketosis or the ketosis is complicated by other abnormalities."[122] In other words, primary (spontaneous) ketosis is considered as a distinct disease entity in contrast to secondary (complicated) ketosis arising from (other) disease processes. This is difficult to accept as we believe that ketosis represents a manifestation of an acute caloric deprivation coupled with the stress of heavy lactation. In this sense, it is still a secondary condition. Ketosis results from the catabolic and antianabolic effects of the adrenocortical hormones, not from a deficiency of these substances.[92] It is more likely that ketosis develops when the enzyme systems (those concerned with β-oxidation, deamination, and formation of carbohydrate from fats and proteins, as a result of carbohydrate deprivation) fail, with a consequent increase of ketones in the blood and tissues of the animal. Inasmuch as our cases followed, for the most part, nutritional deprivation at one place or another, they should rightly be classified as "secondary" cases. We prefer to let the experts argue about this point, however.

In any event, we believed that we were treating field cases of ketosis as diagnosed by the average veterinarian. The ability of the practitioner to diagnose ketosis has recently been questioned, and it has been stated that few of us understand the disease.[100] In other words, if a cow treated

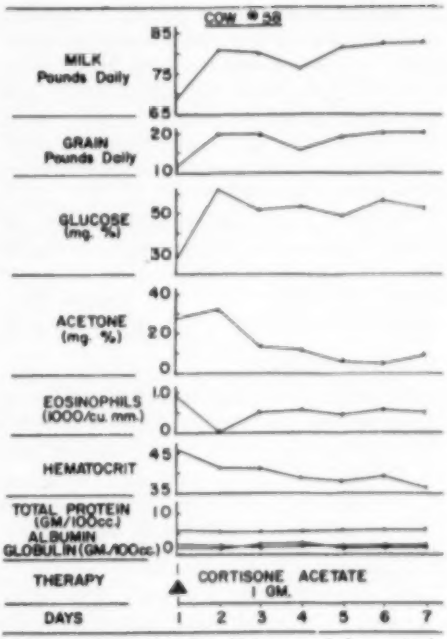

Chart 11—Cow 58, 1 of 6 which responded to a single dose of cortisone, made a satisfactory recovery, indicating that cortisone is a relatively effective treatment.

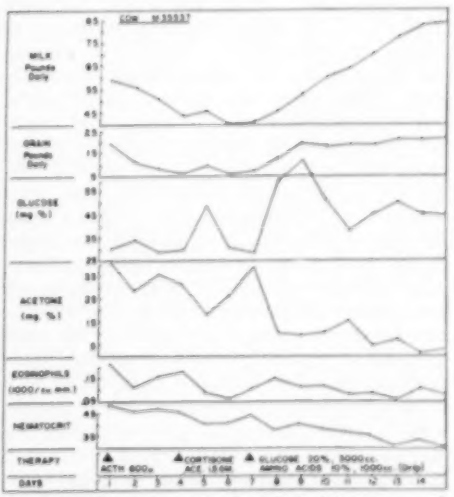

Chart 12—This cow was 1 of 2 which did not respond to ACTH and cortisone but made a satisfactory recovery following parenteral therapy.

for ketosis with ACTH does not respond, the veterinarian has made a wrong diagnosis. In the cases reported here, other diseases were ruled out by physical and laboratory examinations, yet some cases did not respond to the hormones. If these animals did not have uncomplicated ketosis, what disease did they have?

The ideal method of ketosis therapy, especially for refractive cases, is probably the combination of nutrients, to be given slowly (drip) by vein, with the addition of hydrocortisone or ACTH in the solution.

Amino Acid Therapy

We have been criticized for employing amino acids intravenously in the treatment of ketosis, and a word of explanation may be appropriate.

Cows severely affected with ketosis go into a definite nitrogen-negative balance. Proteinuria is a common finding. The term is preferable to albuminuria as other proteins than albumin are also excreted in the urine. In some cows, red blood cells are present in the urine. It is my opinion that both the proteinuria and hematuria (when present) result from a shrinking blood volume. In such cases, which usually are resistant to any form of therapy, I have found amino acids with glucose and hydrocortisone (500 mg.), given by the drip method, to be successful. The criticism of amino acid therapy has arisen from the use of these nutrients alone. If amino acids were used alone in ketosis, they would further tax the overworked liver and might not be completely deaminized. They might even add to the ketonemia, as some of the amino acids are ketogenic. It has been shown that for certain amino acids to enter the Kreb's citric acid cycle, with the consequent production of energy, adequate supplies of oxalacetate and active acetate are required.[12,14] The oxalacetate is derived primarily from glucose metabolism, so some glucose is required for deamination of certain amino acids. A large quantity of glucose administered simultaneously with the amino acids decreases the necessity for amino acids to partake as a source of Kreb's cycle intermediaries, thereby sparing them for protein anabolic processes. This is our aim in this form of therapy.

Summary**

Ketosis is a seasonal disease. The nutritive ratio rather than the plane of nutrition is important. Its development depends on the degree of deficiency in relation to the stress of heavy lactation. Obesity predisposes to ketosis.

No one treatment is effective in all cases. Since spontaneous remissions occur, caution is urged in evaluating any form of therapy. The hormones aid in restoring physiological equilibrium in any disease process. However, they are not substitutes for nutritives which are the only means of preventing deprivation states.

The writer does not consider hormones to be "specific" for bovine ketosis.

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**For a more complete and illustrated summary of this article, see the abstract published in the JOURNAL (April, 1955): 288-289.

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Immunology of Teschen Disease

When living Teschen disease virus is given to pigs intramuscularly, it is actively immunogenic though fairly harmless. Using 2 ml. of a 10 per cent suspension of infective spinal cord, emulsified in 1.5 ml. of liquid paraffin, two injections were given one month apart to 3,000 pigs. Results were satisfactory although paralytic complications occasionally occurred after the first injection. The possibility of multiplicity of antigenic types of the virus must be determined. As with poliomyelitis, *gamma* globulin prepared for hyperimmune serum is an effective prophylactic without interfering with the production of active immunity. Therefore, to avoid paralytic complications, *gamma* globulin could be given simultaneously at the first vaccination.—*Vet. Bull., April, 1955.*

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

A New Method for Repairing Fractures of the Olecranon

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A 4-year-old male Wire-Haired Fox Terrier had been lame in the left foreleg for approximately four months and had been treated for what was thought to be an arthritic condition with a possible luxation at the humeroradial joint. He had a typical, swinging-leg lameness but was able to support weight firmly on the affected limb. He also had a stiff gait with apparent inability to adduct the limb properly. Palpation failed to reveal any areas of tenderness, increased heat, crepitation, or swelling but there was a marked atrophy of the triceps muscles. A radiograph of the left forelimb revealed a separating transverse fracture at the proximal extremity of the ulna (fig. 1), with the olecranon misplaced forward and upward. This malposition was no doubt due to contraction of the triceps muscles and the separation was responsible for the nonunion. Although the fracture was known to have been present for several months, the radiograph showed no evidence of callus formation.

It was felt that the usual types of splints would not be effective in this case so a Hagie intramedullar bone pin was tried. The Hagie pin is a stainless steel pin threaded throughout its entire length. The pin used in this instance was 3/32 inch in diameter on the heavy end and 1/16 inch in diameter throughout the balance of its length, with a small countersunk-type nut or collar threaded on the exposed end.

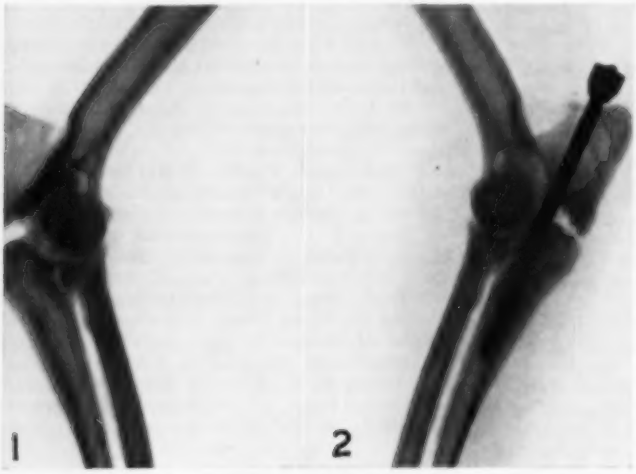

Fig. 1—Radiograph showing separating fracture of the ulna of a dog.

Fig. 2—Radiograph showing ulnar fracture after it was stabilized by use of a Hagie intramedullar bone pin.

This nut can be turned in either direction to tighten or loosen the upper fragment of the bone. This type of pin does not need to be removed following healing of the fracture.

The patient was anesthetized with pentobarbital sodium, and the forelimb was prepared for surgery. A semicircular incision was made just anterior to the oclecranon process, parallel to the long axis of the leg, and deep enough to expose the fracture. A small curette was then inserted between the ends of the fractured bone and both

Captain Roach, a general practitioner in Frankfort, Ky., is currently serving in the Veterinary Corps of the U. S. Air Force.

ends were scraped to freshen their surfaces. After crystalline penicillin had been injected directly into the fracture, the incision was closed with No. 00 gut. Next, a small incision was made in the fibrous connective tissues directly on top and in front of the olecranon. A 9/64-inch drill was inserted into this incision and a hole drilled completely through the long axis of the olecranon down to the fracture. A 7/64-inch bit was then used in this same hole to continue approximately 3 cm. farther into the medullary cavity of the distal portion of the bone. This smaller hole is necessary in order to firmly anchor the threads of the pin in this distal portion while the hole in the proximal portion allows free movement of the pin. The pin was then inserted, anchored in the distal portion, and screwed down tightly to bring the proximal and distal portions of the bone into apposition. The pin was then cut off flush with the head of the collar and the fascia and connective tissue were sutured directly over this stump. The wound area was bathed with crystalline penicillin and sutured.

The patient was given routine antibiotic treatment for several days. A radiograph (fig. 2) shows the location of pin after immobilization was accomplished. No other means of immobilization was used.

Six weeks after surgery, the dog was walking normally and the atrophy of the triceps group of muscles was disappearing. Radiographs showed a normal bone callus forming. The pin can be removed if necessary.

PPLO in Semen of Danish Bulls.—Pleuropneumonia-like organisms were found in 94 per cent of the semen samples of 35 bulls studied, regardless of their fertility. These organisms could not be differentiated from those identified as pathogenic for cattle ("P" strains). It is assumed that these organisms are saprophytic in the prepuce but whether they can become pathogenic under certain circumstances remains to be determined.—*Nord. Vet.-med., 1955.*

Inbreeding and Embryonic Mortality.—An analysis of 837 services indicated that, in cattle, inbreeding tended to increase embryonic mortality.—*J. Dai. Sci., April, 1955.*

Urolithiasis or Urethral Impaction in the Cat

JULIUS FISHLER, D.V.M.

Elkhart, Indiana

Acute urinary retention in the male cat usually is the result of an occlusion of the urethra by small sandlike stones or an accumulation of mucus. It would seem, from observation, that infection, pH of the urine, and diet are among the more common factors that favor the formation of these stones or plugs of mucus. It is said that the bacteria of the Proteus species are usually present and that these organisms only grow when the urine is alkaline. In our experience with these cases, the urine is always more or less alkaline.

In examining a patient with urinary retention, it is wise to first obtain as accurate a history as possible about previous attacks and how long the present symptoms of straining and licking the penal orifice have been noticed. Next, the prepuce should be examined to see if the hair is matted over the orifice or if plugs are lodged in the urethra at the end of the penis. Obstructing plugs, consisting of either small grains of sand or a putty-like mass of mucus, can sometimes be dislodged by rolling the penis between the thumb and forefinger. In a few cases, by pressing gently on the distended bladder with one hand and rolling the penis between the thumb and forefinger of the other hand, it is possible to dislodge the plug and relieve the obstruction. If this fails, anesthesia and further manipulation are usually necessary.

The bladder will usually be found to be in one of three conditions: (1) Usually, the bladder is greatly distended, the wall is thin, and the urine, when seen, is amber-colored, clear, and alkaline. If the obstruction can be released, the cat can be expected to respond to treatment. (2) In some cats, the distended bladder is filled with urine that is bloody or contains blood clots. These animals respond slowly because of extensive damage to the bladder wall. (3) On rare occasions, the bladder wall will be found to be greatly thickened because of chronic inflammation. The thick-

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This paper was presented at the Midwest Small Animal Hospital Association meeting, Nov. 11, 1953.

ened wall will not permit the bladder to expand or contract properly and, in these cases, about 20 cc. of turbid, cloudy urine is all that it contains.

TREATMENT

Emergency Treatment.—If the cat is toxic and vomiting, he undoubtedly is suffering from uremia and it is of utmost importance that the urine can be secreted by the kidneys, thus relieving the uremia. The operator's ability to remove the urine usually determines whether the patient is lost or saved.

A urethral catheter is a lethal weapon in the hands of most people. In the experience of the author, the cat that has been catheterized usually is never again normal in his urinary habits. The mere passing of a catheter, no matter how well lubricated, causes much irritation and damage to the delicate tissues of the urethra. Because of this, the urine should be aspirated by inserting a 20- to 22-gauge hypodermic needle directly into the bladder through the abdominal wall. It is best to do this by using a needle with a bevel- or flat-ground point, because such a needle does little or no damage to the bladder wall. A hollow-ground point cuts a hole and removes a piece of tissue, leaving a perforation in the bladder wall. It may be necessary to empty and to flush the bladder many times and, by using this method, there seems to be little danger of permanent injury or of causing peritonitis. In one instance, we punctured the bladder three times daily for six days before urination through the urethra was established.

After the urine is removed, the bladder should be flushed with a 0.2 per cent acetic acid solution. The solution can be injected directly into the bladder and then aspirated with syringe. Urologists have used this method for the same condition in man. Solutions of streptomycin have been used for the purpose of flushing the bladder but it is better to inject the streptomycin intramuscularly, since it has been shown that in a short time the streptomycin is concentrated in the bladder anyway. Hyaluronidase has been recommended as an adjunct to stopping the formations of sandlike uroliths. We have used it a few times but find it has little value in these cases.

There are many theories regarding the pH of the urine and its effect on the formation of plugs of mucus and uroliths. However, it seems that, basically, the trouble is caused by urinary infection and that alkaline urine favors this infection. Therefore, if the pH can be changed to the acid side, this should hasten recovery. To establish acid urine we use chlorethamine® orally, a 1.5-gr. tablet two or three times daily.

To prevent relapse, we have found that rigid control of the diet is necessary. However, prescribing what a cat should eat and getting it to eat it are two different things. Fat seems essential to keep the urine acid so we attempt to raise the fat content of the food intake by feeding fat hamburger, raw if possible, by eliminating canned fish, and by adding suet or lard. Adding butter or chopped liver or kidneys to the hamburger works well with some cats. It is advisable to increase the water intake but this is not easy to manage. It has been suggested that if some fish, such as mackerel, is boiled in water and the juice from this is given to the cat, it will increase the water intake. This works well in some instances.

Chlorethamine should be given reguarly, so some is sent home with the owner along with litmus paper so that the urine can be tested to see that it remains acid.

It is suggested that cats should not be castrated under six months of age since if they are allowed to mature sexually, the urethra will be of a larger diameter than if they are castrated early. Obviously, a larger urethra will favor the passing of larger particles of mucus and uroliths. This is not the complete answer to the problem. Many urethral obstructions are found in uncastrated male cats.

Sometimes, following a case of urethral obstruction, the bladder will lose normal muscle tone, due to fatigue from prolonged extreme distention, and will not contract. This is referred to as retention with overflow. This adds to the problem because retained urine breaks down and becomes alkaline, bringing on again all the troubles that come with alkaline urine.

Urecholine® (Merck), a parasympathomime stimulant, is useful in nonobstructed retention. The drug, if the dose is kept low, will not cause diarrhea but will cause spontaneous contraction of the bladder. The drug comes in 5-mg. tablets and ¼ tablet (1.25 mg.) is sufficient for a 7½-lb. cat.

The drug should be repeated as often as bladder contraction fails. One must be sure, however, that the urethra is not occluded or the forced muscle contraction may cause a rupture of the bladder wall. Injectable urecholine is also effective while the cat is hospitalized.

Dangers of Efocaine Anesthesia

Another case of paraplegia in man following the use of efocaine, injected directly into four intercostal nerves at the termination of surgery, is reported. Three weeks later, complete loss of spinal cord function below that area occurred, and the patient is doomed to a wheel chair existence. It is doubted that the cord damage could be due to the small amount of efocaine which could have entered via the perineural sheath. It is more apt to have followed thrombosis of an intercostal vein and intramedullary thrombosis with necrosis, such as was found on necropsy in a previous case.—*Brit. M. J., May 28, 1955.*

Prolapse of Rectum Associated with Urinary Calculi in a Pig

WILLIAM H. BECKENHAUER, D.V.M.

Fort Collins, Colorado

On Jan. 22, 1955, a 50-lb. castrated male Duroc pig with a prolapse of the rectum was presented at this clinic. His condition was good, his temperature normal, but he did some straining. The prolapse had apparently occurred recently, as the mucosa, although a bright pink, was without visible lacerations or necrosis. It was about 5 cm. in diameter and 4 cm. in length.

The prolapsed mass was cleaned with soap and water, followed by a quaternary ammonium antiseptic. It was then injected with about 30 cc. of 50 per cent dextrose solution, infiltrating all layers of the everted gut. The pig was then restrained by the hindlegs, head down, and the prolapsed rectum was lubricated and reduced. A figure-8 retention suture of double-strand, ⅛-inch umbilical tape was placed in the anus (fig. 1) and the pig was placed in a stall.

Six hours later, the retention suture was untied and loosened to permit defecation after which the suture was retied.

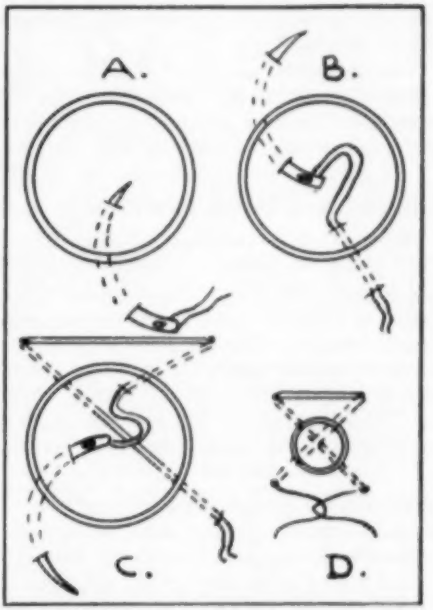

Fig. 1—This figure-8 retention suture is placed as follows: It is passed through the skin ventrolateral to the anus (A), into the lumen of the rectum. Then it crosses the lumen diagonally and is inserted from inside the rectum (B), emerges through the skin dorsolateral to the anus, is carried to the other dorsolateral side of the anus, and the process is repeated (C) at a right angle to the first suture placement. The suture ends are pulled up snugly, puckering the tissues to close the orifice, and the suture ends are tied (D) with a bowknot. Periodic loosening of the knot permits defecation.

The next day the pig was apparently normal. His temperature was 103.0 F. in the morning, 102.2 F. in the evening, the prolapse had not recurred, and he ate sparingly of milk and grain.

The second morning, his condition had markedly declined. He would not rise, his temperature was 103 F, and he had a convulsion. Death followed in about one hour.

Necropsy findings were reported as follows: "Hypostatic congestion of the left lung, catarrhal enteritis, ruptured bladder with necrotic exudate and hemorrhage on the mucosal surface, with a tear, 3 or 4 inches long near the urethra. Numerous calculi were present in the bladder. The diagnosis was rupture of the bladder with

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toxemia (uremia) and peritonitis. Urinary calculi present."

Unfortunately, no calculi were saved for chemical analysis. It is suggested that the calculi, by blocking the urethra, caused the straining which resulted in the prolapse.

Vibriosis and Bovine Infertility

Vibriosis is a venereal infection which, like a bank embezzler, may exist undetected for a long time. *Vibrio fetus* produces few signs of infection except abortion and failure to conceive. The organism may be confused with an apathogenic Vibrio which also frequents bovine genital organs. It can be differentiated by its lack of catalase activity.—*Agric. Res., June, 1955.*

Interdigital Vegetative Dermatitis

This inflamed tissue, which often develops between the toes of cattle, is commonly called a corn or an interdigital hyperplasia. It may be the result of the normal interdigital pad of fat expanding in overfat animals, thus becoming irritated and infected. Or it may be the result of overweight causing a weakening of the interdigital ligament which, by allowing the toes to spread, results in excessive movement and exposure to injury.

In some individuals, the weak ligaments are inherited. The condition is aggravated by confinement in muddy yards or wet stalls. The growth can be removed surgically but unless the predisposing causes are removed, it tends to recur.—*B. W. Kingrey, D.V.M., Am. Hereford J., May, 1955.*

An Extrauterine Twin

When a native African woman had been in labor 15 hours, the rhythmic labor pains were replaced by a continuous abdominal pain. Laporatomy, 17 hours later, revealed twin fetuses, one of which had developed dorsal to the uterus with its head at the pelvic inlet. Its position had prevented the intrauterine twin from entering the pelvis, thus causing the uterus to rupture. This fetus was dead and the uterus had involuted but the extrauterine fetus was alive. Its membranes had to be peeled from the broad ligament, the posterior surface of the uterus, the sides of the pelvic cavity, and parts of the intestine. The attachment of the placenta, however, was not determined because of the necessary haste.

A subtotal hysterectomy was performed and the woman eventually recovered. It is believed that the extrauterine gestation had started as a tubule pregnancy, that the tube ruptured without interrupting the placental attachment and that the placenta, as it developed, attached itself to the broad ligament.—*Brit. M. J., April 23, 1955.*

Estrous Cycle of Hamsters

The female hamster comes in heat, with few exceptions, every fourth day. However, since hamsters are nocturnal in habit, it is more accurate to say every fourth evening. If placed together at other times, the male and female will fight on sight. While in heat, the female will "freeze" almost as soon as she sees or smells a male. She will stare fixedly ahead and allow herself to be nosed and pushed around. The male should not be allowed to remain more than about 20 minutes or the fight may be resumed. The gestation period is about 16 days.—*All Pets Magazine, May, 1955.*

Internal Secretion of the Placenta.—Estrogenic substances produced by the syncytium of the placenta are reported to be responsible for the hypertrophy of the uterine muscle without which delivery would be impossible. The onset of labor is regulated by hormones, it being possible to shorten or prolong pregnancy in the rabbit by changing hormonal conditions.—*J.Am.M.A., May 14, 1955.*

Mammary Actinomycosis in a Bitch.—Surgical treatment, accompanied by nicotinic acid hydrazide therapy, and followed by iodine therapy, failed to control actinomycosis involving the mammary glands and the overlying skin of a bitch. The infection was eliminated by a course of streptomycin therapy.—*Vet. Bull., Feb., 1955.*

Spermatozoa required 20 days to pass through the epididymis in rams.—*Vet. Bull., April, 1955.*

CLINICAL DATA

Cryptococcosis in Animals

Major CHARLIE N. BARRON, V.C., U.S.A.F.

Washington, D. C.

CRYPTOCOCCOSIS (torulosis, European blastomycosis), recognized for over half a century as a fungus infection of man and animals, is being demonstrated with increasing frequency in this country in a variety of animal species. This is apparently due in large measure to the greater frequency of histopathological examination of autopsy materials, especially of the brain and its meninges.

The causative organism in both animals and man is *Cryptococcus neoformans*. (*Cryptococcus hominis, Torula histolytica*). In man, at least, it has a special affinity for the central nervous system, with meningitis the most frequent manifestation, although it may involve the lungs or produce a generalized infection. In animals, in addition to experimental infections, the organism has been found in spontaneous pulmonary and nasal lesions, sometimes associated with a chronic nasal discharge, and in mammary and central nervous system lesions. Generalized infections sometimes occur. There is no evidence that the disease is acquired from a definite exogenous source, although recent observations indicate spread from animal to animal in some instances.

LITERATURE CITED

In 1861, Zenker, according to Freeman,[1] reported a probable case of cryptococcosis of man, the first published account of the infection. The first culturally proved infection in man was reported in 1894 and 1895 (Benham[2]). In 1916, Stoddard and Cutler[4] established cryptococcosis as a definite mycotic infection that fulfilled Koch's postulates, and named the causative organism *Torula histolytica*. In 1934, Benham[5] showed that many of the minor differences among the human strains of Cryptococcus were actually variations within a single species, *C. neoformans*, and in 1950 she[7] re-evaluated the pathogenicity and nomenclature of the organism. The literature on human infections has recently been reviewed by Cox and Tolhurst,[6] Ratcliffe and Cook,[7] and Zimmerman and Rappaport.[8]

Cryptococcosis has seldom been reported in animals, but the failure to make adequate histopathological and bacteriological examinations routinely may well account for this. In 1948, Saunders[9] included the reported cases of cryptococcic infection in a general review of systemic fungous infections in animals.* Redaelli and Ceferri[10] cited cases which they considered to be European blastomycosis. They referred to Sanfelice, who, in 1895, reported the isolation of a Cryptococcus from the lymph node of an ox in Italy; possibly this represents the first record of the infection in an animal. In another of their cases, a Cryptococcus organism was isolated from a myxomatous tumor of the nasal cavity of a cow, also in Italy. Vuillemin[11] in France, in 1901, found cryptococci in a pulmonary lesion of a pig.

Frothingham,[13] in 1902, described a yeastlike fungus producing a myxoma-like mass in the lung of a horse in Massachusetts following a persistent nasal discharge for a year. Meyer[20] gave the name *Torula nasalis* to the organism he recovered from a myxomatous nasal growth of a horse in Pennsylvania in 1912. This organism, like that described by Frothingham, was pathogenic for the guinea pig and, when later studied by Harrison,[14] was found to be almost identical with a human strain of *C. neoformans*. Kikuchi,[16] in 1923, demonstrated a yeastlike organism from mycotic nasal "granulomas" of a horse. Schellner,[18] in 1935, recovered, from similar mycotic nasal "granulomas" of a horse in Germany, a yeast that was pathogenic for mice and guinea pigs but not for other horses. In 1935 also, Weidman[17] isolated *C. neoformans* from a growth on the lip of a horse in Philadelphia. At necropsy, the animal was found to have a generalized cryptococcic infection.

In 1934, Weidman and Ratcliffe[19] described fatal generalized European blastomycosis in a cheetah in the Philadelphia zoo. The organisms produced meningitis, cystic lesions of the cerebral cortex, and massive infiltrations and enlargements of the spleen and kidney which were mistaken for neoplasms on gross examination at necropsy. Cryptococci were found in sections of the liver, lungs, kidneys, brain, and various lymph nodes; they had replaced practically all of the splenic tissue except the capsule. In 1945, another cheetah

From the Armed Forces Institute of Pathology, Washington, D.C.

*Since submitting this article, Dr. Sanders, Brookhaven National Laboratory, has drawn my attention to another report (see ref. 35) that he found subsequent to his review on fungous diseases in 1948.

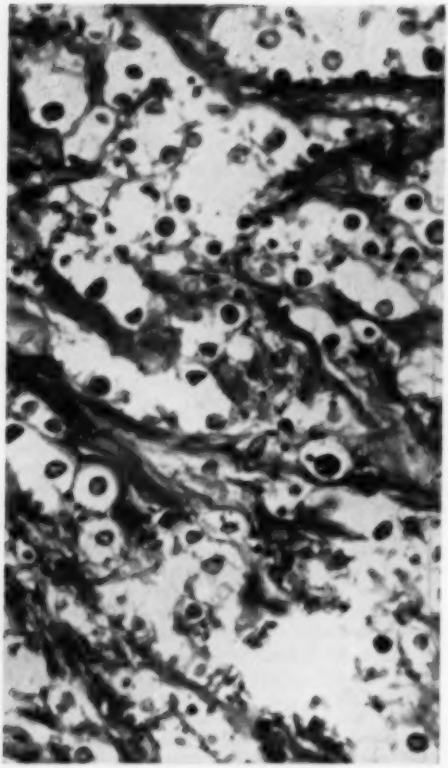

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Fig. 1—Cryptococcus neoformans in the connective tissue of the pharyngeal mucosa of a 6-year-old male domestic cat showing infiltration and replacement of tissues. The clear halo about each organism represents the mucoid capsule. Hematoxylin and eosin stain, x 395.

in the Philadelphia zoo was found to be similarly affected.[9]

Madsen,[19] in 1942, described a Cryptococcus from the purulent lymph nodes of a cow in New York State. The organism was pathogenic for guinea pigs and mice, causing necrotic foci in all the visceral organs.

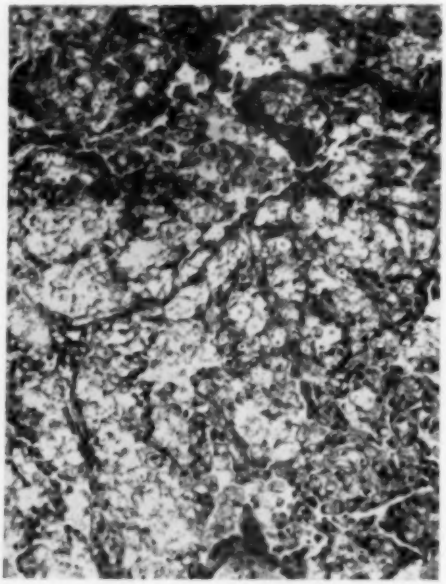

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Fig. 3—Characteristic lesion in lung of a 6-year-old male domestic cat showing proliferation of yeastlike organisms in alveoli with a minimal macrophage response. Hematoxylin and eosin stain, x 125.

RECENT REPORTS OF CRYPTOCOCCOSIS

Cryptococcosis in Cats.—Recently, a number of cases of cryptococcosis have been recognized in animals. In 1952, Holzworth[20] reported the spontaneous disease in a 6½-year-old male domestic cat in Springfield, Mass. The diagnosis of this case was made in 1951 at the Armed Forces Institute of

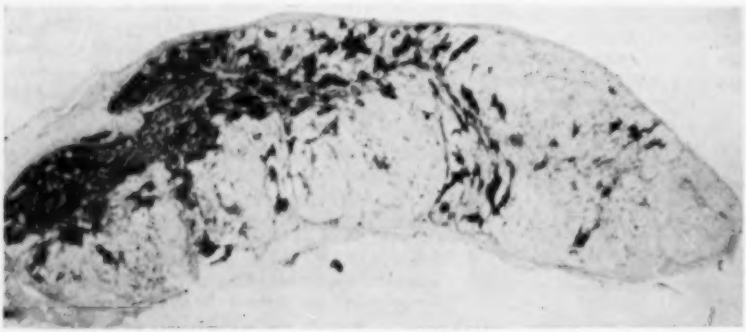

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Fig. 2—Cryptococci (pale areas) distending and replacing the lymphoid elements (dark areas) in the pharyngeal lymph node of a 6-year-old male domestic cat. Hematoxylin and eosin stain, x 6.

Pathology, where it became the first in the files to represent the natural infection in an animal. This cat was obviously ill for approximately a month prior to euthanasia, with respiratory difficulty, cough, and nasal and ocular discharges. On clinical examination, small proliferations of tissue were observed in both nostrils in conjunction with a sanguineous nasal discharge. A small ulcerated mass was present on the anterior surfaces of the hard palate and a smaller growth posteriorly. The tonsils were reddened and prominent and the cervical lymph nodes were enlarged. An increased vesicular murmur and occasional râles were heard in the lungs. At necropsy, in addition to the changes described, the lungs were congested, edematous, and firm, with occasional white spots, 1 to 5 mm. in diameter, visible on the surface and throughout the parenchyma. The central nervous system was not examined.

Microscopically, the tissues of the palatine lesion appeared to be undergoing liquefaction as the result of the proliferation of a yeastlike organism. In the lungs there was a patchy, diffuse, rather extensive involvement, both parenchymally and subpleurally, by the same organism. The lymph nodes examined were extensively involved, the organisms replacing the bulk of the lymphoid tissues. One small focus of the organisms was found in the adrenal medulla adjacent to the cortex, and another in the thyroid gland.

—*A.F.I.P. Acc. 324207*

Fig. 4—Small focus of cryptococci with replacement of the parenchyma and minimal tissue reaction in the adrenal medulla of a 6-year-old male domestic cat. Hematoxylin and eosin stain, x 48.

In 1953, Holzworth and Coffin[21] reported a case in a 6-year-old spayed female domestic cat from Massachusetts. This case was somewhat similar to the previous case in that the cat had suffered from a chronic

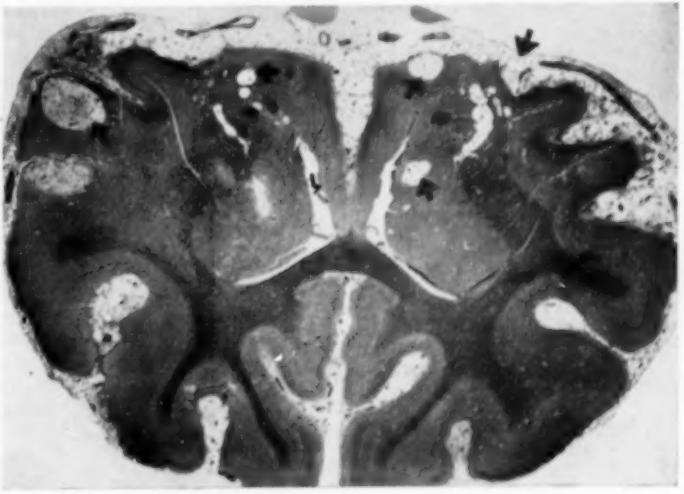

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Fig. 5—Cryptococcosis of the central nervous system of a 3-year-old domestic cat showing characteristic cystic lesions (arrows) of brain and meninges filled with yeastlike organisms. Hematoxylin and eosin stain, x 2.

respiratory disorder of some duration and that the symptoms and gross appearance of the lesions were considered suggestive of a neoplasm. Terminally, the cat exhibited blindness and symptoms interpreted as evidence of central nervous system involvement. The diagnosis of cryptococcosis was established histologically. The only lesion observed on necropsy was a submucosal mass involving the pterygoid and presphenoid bones and extending through the bone to a point where it impinged on the optic nerves and caused pressure on the cerebrum. It is not indicated that the eyes were examined histologically.

Bovine Cryptococcosis.—Subsequent to the receipt of the first case of feline infection at the Armed Forces Institute of Pathology, tissues of bovine origin infected with *C. neoformans* were submitted by several contributors. These tissues were from the same outbreak of cryptococcosis, which appeared as an enzootic form of mastitis in a dairy herd in Maryland. This outbreak has been described in detail in recent publications by the various investigators concerned. Pounden *et al.*[23] reported on clinical aspects of the outbreak; Innes *et al.*[22] on the pathology; and Emmons[24] on the identity and characteristics of the organism. The infection spread among cattle in the milking herd as a primary mammary gland involvement, apparently acquired through the milking line-up and possibly by means of contaminated milking machines. One or more quarters of the udder were involved and there was extension to the corresponding regional lymph nodes, the supramammary nodes and, at times, to the external iliac or deep inguinal nodes. Lung involvement, consisting of small, recent metastatic foci, was seen in only 1 cow.

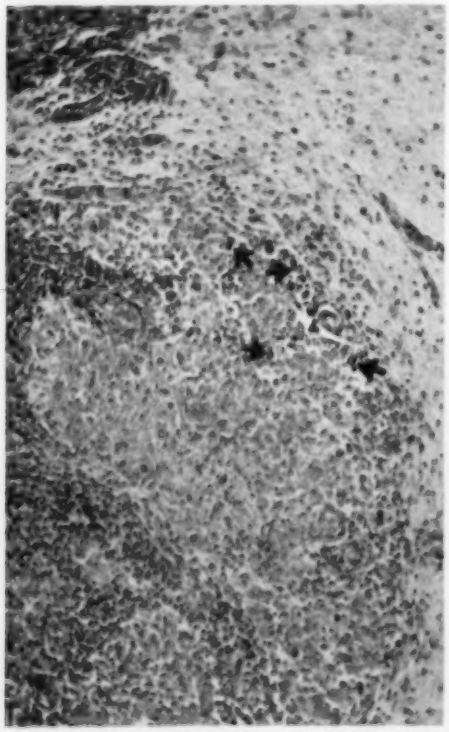

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Fig. 6—Cryptococcosis of brain of a 4-year-old male dog showing a granulomatous response (arrows) to the organisms. Mucicarmine with Van Gieson counterstain, x 130.

The bovine mammary infections were characterized by: progressive hardening and swelling of the quarter or quarters affected; grayish white, stringy secretions; pain, as indicated by a reluctance to move for food or water and refusal to lie down, resulting in a considerable loss of weight; but rarely an elevation of temperature.

Gross and microscopic examinations revealed that the infection spreads in an irregular, radiating manner from the portal of entry in a teat throughout a quarter, with subsequent spread to adjacent quarters apparently by contiguity, and to regional lymph nodes receiving lymphatic drainage from the involved areas. The infected mammary tissues were extremely firm, fleshy, partly hemorrhagic, and divided into large coarse lobules. From innumerable foci there oozed a thick slimy exudate or secretion in which cryptococci could be demonstrated microscopically or by cultural means. The involved supramammary and other regional lymph nodes were enormously enlarged, lay in a partly edematous loose tissue, and when cut had a fleshy water-logged consistency and appearance, with scattered hemorrhages somewhat similar to those in the mammary tissue. Other tissues and organs exhibited no evidence of involvement by the organisms.

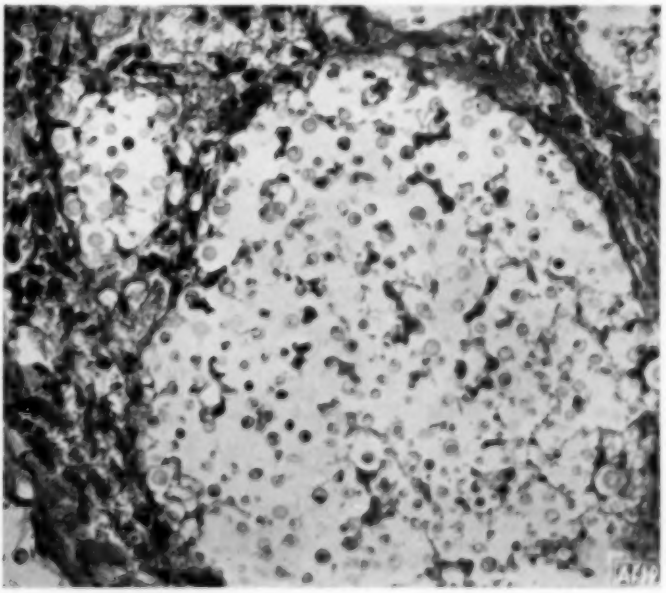
Microscopically, the organisms were demonstrated in extreme abundance in both the affected udder and lymph nodes. In the mammary gland, the organisms filled and distended the ductal structures and

largely obliterated the epithelial linings. They were suspended in an abundant gelatinous exudate or secretion, consisting in part of mucoid materials derived from the capsule surrounding the individual organisms. The parenchyma of the lymph nodes was largely replaced by cryptococci. There was essentially no reaction to the organism on the part of the host in any of the involved tissue in most instances.

Subsequent to the above outbreak (1952), Leonard and Short[25] showed the author cultures of a Cryptococcus that they had isolated from the spinal fluid of a Hereford cow in Oklahoma. The cow exhibited symptoms of central nervous system involvement but her subsequent fate was unknown.

Simon *et al.*[26] in 1953 reported an outbreak of mastitis in a Wisconsin dairy herd, probably resulting from routine intramammary infusions. The features were apparently similar to those presented by the Maryland outbreak although, at least in some individuals, the reaction was more extensive, with the causal organism not as readily evident. An extensive granulomatous reaction of an epitheloid nature and somewhat suggestive of sarcoid was observed in some mammary glands. It was demonstrated that the organisms were destroyed in milk by standard pasteurization methods. Carter and Young[27] have isolated this organism from a bulk sample of milk derived from a herd of 25 cows in Scotland but detected no animal with the disease when they attempted to trace the source of the organism.

Cryptococcosis in Dogs.—Cryptococcosis has also been observed recently in dogs where it has been characterized by involvement of the central nervous system. In 1953, Seibold *et al.*[28] reported a case in a dog from Alabama. The dog presented meningeal and brain lesions on histological examination. Changes noticed in the lungs and spleen at necropsy, although not studied histologically, suggested the possibility of systemic infection. Helmboldt and Jungherr[29] contributed a similar case in a dog from Connecticut to the A.F.I.P. in 1952 and later reported it at the 1952 pathology seminar of the American College of Veterinary Pathologists. This latter case was in a 4-year-old male dog with vague symptoms referable to the central nervous system, which increased until the dog's gait became unsteady and it began circling, always to the left. Several months after the onset, euthanasia was performed. Only the brain was submitted for pathological study. Grossly, the right portion of the thalamus back to the pons contained four or more

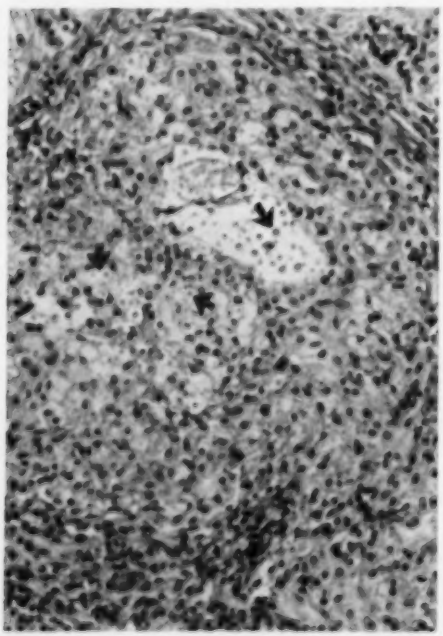


—*A.F.I.P. Acc. 494374*

Fig. 7—Cryptococcosis of mammary gland of lactating dairy cow showing destruction of epithelial linings, lack of reaction, and marked distention of lumens by innumerable organisms. Hematoxylin and eosin stain, x 186.

circular translucent areas, approximately 2 mm. in diameter. The veterinarian reported similar areas in the lumbar cord. He regarded other organs as essentially normal. Microscopically, multiple focal granulomas were observed chiefly within nervous tissue and only rarely in the meninges. Associated with these granulomas were budding, yeastlike organisms with a mucoid capsule, morphologically compatible with *C. neoformans*.

Miscellaneous Reports.—McGrath[30] presented a paper in 1954 on cryptococcosis of the central nervous system in domestic animals. He reported 6 cases that had been examined postmortem at the School of Veterinary Medicine, University of Pennsylvania, during the preceding five years. The primary clinical manifestations were neurological. Three cases occurred in cats aged 7 months, 3 years, and 4 years, respectively, the first 2 being generalized. Two cases occurred in dogs aged 2 and 3 years, respectively, the first case having been previously recorded by Stubbs.[31] The sixth case was in a 5-year-old male Standardbred horse whose initial symptoms were blindness and slight incoordination. Gross findings after euthanasia three and one-half months later were not significant, but histological examination revealed chronic meningitis of brain and cord with giant cells containing typical yeastlike bodies. Typical organisms were cultured from 1 cat and 1 dog; the diagnoses of the other 4 were based on gross and microscopic findings. Subsequent to the above report, McGrath[32] obtained another case of cryptococcosis in a 2-year-old Boxer dog with blindness and encephalitic symptoms. In this case, granulomatous lesions were found involving the nasal sinuses, nasal pharynx, lungs, and brain.



—*A.F.I.P. Acc. 54-26537*

Fig. 8—Cryptococcosis of mammary gland of a lactating dairy cow showing an extensive epithelioid granulomatous response (arrows) to the organisms. Hematoxylin and eosin stain, x 175. This illustration is a reproduction of one used at the American College of Veterinary Pathologists' seminar in 1953, through the courtesy of Dr. S. H. McNutt (from an outbreak reported by Simon et al.[28])

In 1953, Takos and Elton[33] reported 2 cases of spontaneous infection with Cryptococcus in the Marmoset monkey, *Leontocebus geoffroyi*, of Panama, representing the first cases of cryptococcosis to be described either from the Isthmus of Panama or in monkeys. These were primarily lung infections with involvement observed also in the spleen, small intestine, lymph nodes, and liver. Yeast cells were found in glomerular capillaries of the kidneys and in vessels of the liver, myocardium, parotid gland, adrenals, and pancreas. In 1953, systemic infection was observed in a small-toothed palm civet that had died at the National Zoological Park in the District of Columbia. The tissues were submitted to the A.F.I.P. by Eyestone.[34]

DIAGNOSIS AND TREATMENT

Cryptococcosis may be diagnosed, on cultural grounds, by animal inoculation or by the morphological appearance of the organisms either in smears or tissue sections. *Cryptococcus neoformans* is a yeastlike organism that reproduces by budding both in tissues and cultures. It does not form a true mycelium. The organism has a definite cell wall enveloped by a characteristic mucoid capsule that appears as a definite halo in India ink suspensions and most stained sections, but stains positively with mucicarmine and in the periodic acid Schiff reaction. It must be distinguished from other pathogenic yeastlike organisms such as *Blastomyces dermatiditis*, *Coccidioides*

immitis, *Paracoccidioides brasiliensis*, and others, the first two of which have been reported a number of times in animals in the United States. These and similar mycotic organisms have various individual characteristic features and a cell wall that stains positively with the periodic acid Schiff reaction. Only Cryptococcus has the mucin-staining halo which is apparently specific and a helpful diagnostic aid.

The gross appearance of cryptococcosis is in no way characteristic. When affected the piarachnoid may be cloudy and somewhat thickened. Typical gelatinous cysts may be present in the gray matter or meninges. Generalized infections may superficially resemble multiple neoplasms. Microscopically, the reaction to large numbers of cryptococci is seldom profound and, when observed, usually consists primarily of macrophages, giant cells, and some fibrosis with a few plasma cells and lymphocytes. A definite, predominantly granulomatous response may be observed. The other yeast-like infections evoke extensive granulomatous inflammation, some giant cells, and variable degrees of suppuration, usually intense in *B. dermatiditis* infections.

No satisfactory treatment has been found for cryptococcosis. Antibiotics, such as penicillin, are contraindicated. In some cases in man, sulfonamides have been beneficial; in others with localized pulmonary lesions, surgical procedures have proved effective. In outbreaks in cattle, the minimum measures undertaken should involve the usual sanitary procedures, including the segregation of affected animals and the elimination of at least the severely infected animals from the herd. Some infected cows apparently recover. Although animal-to-man infection has not been reported, such a possibility should be given consideration.

SUMMARY

In summary, cryptococcosis is a chronic infection of animals and man of probable world-wide distribution. It is caused by the budding yeast, *Cryptococcus neoformans* (*Torula histolytica*).

Central nervous system involvement is the most commonly recognized manifestation of cryptococcosis in man, and has been observed in all 5 reported cases in the dog, in 4 of 5 cases in the domestic cat, and once each in the cow, horse, and cheetah. Pulmonary lesions and generalized infections have been reported both in conjunction with central nervous system involvement and independent of it.

Cryptococci have been isolated from the lymph nodes of cows on two occasions without specific information as to extent of infection. Two outbreaks of cryptococcic mastitis with regional lymph node involvement and reaching enzootic proportions have been reported recently in dairy herds in the United States. In only 1 of several cows necropsied were pulmonary lesions, quite minute, demonstrated. Infections have been observed on six instances in cattle, six in the horse, five in the dog, five in the domestic cat, one in the domestic pig, two in the cheetah, two in the Marmoset monkey, and one in a small-toothed palm civet. All known cases in animals, with the exception of 7, have been from the United States and the majority of these from the northeastern portion.

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Control of Histomoniasis in Turkeys

The experimental infection of turkeys with *Histomonas meleagridis* (blackhead) was permanently suppressed by the use of 2-amino-5-nitrothiazole (enheptin) at a concentration of 0.1 per cent of the feed when the 14-day treatment was commenced at, or before, the time of infection. Relapses occurred, however, if the drug concentration was less than 0.1 per cent or if the therapy, even when continued for 35 days, was started more than 24 hours after infection.—*Vet. Rec., March 5, 1955.*

Effects of Water Deprivation.—When one group of rats was given water *ad libitum* and another group given half as much for a two-week period, the food intake of the latter group was reduced by 27 per cent, the weight gain was reduced 51 per cent, and the efficiency of food utilization was reduced 31 per cent.—*Nutr. Rev., May, 1955.*

Blackleg in Pigs

Gas phlegmons in swine, resembling blackleg lesions, have yielded only *Clostridium septicum*. In England, a number of such cases occurred in swine kept in a yard where there had been severe blackleg losses in cattle. Cultures taken from the depth of the affected muscle tissue of 2 pigs produced *Clostridium chauvoei*, verified by guinea pig and mouse inoculations, while 2 others yielded only *Cl. septicum.*—*Vet. Rec., April 23, 1955.*

Effect of Penicillin on Intestinal Flora of Swine.—When swine weighing about 175 lb. were fed 60,000 units of procaine penicillin daily for several days, the coli bacteria increased greatly in number and were found farther forward in the intestine, even into the stomach. Lactobacilli were greatly decreased and streptococci almost exterminated while staphylococci were apparently uninfluenced.—*Nord. Vet.-med., 1954.*

Blood Groups in Swine.—Blood studies of 1,500 pigs revealed four different isohemagglutinins and four corresponding antibodies.—*Vet. Bull., April, 1955.*

A Simplified Method for Typing *Salmonella Pullorum* Cultures

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ONE OF THE outstanding contributions of recent years in the field of pullorum disease control was the recognition of antigenic variation in *Salmonella pullorum* and its effects on the results of the agglutination testing for the disease. Younie[1] reported in 1941 that chickens infected with the variant form of the organism may not be detected if an antigen prepared from standard antigenic strains is used in testing. The importance of accumulating information relative to the antigenic structure of *S. pullorum* cultures and the necessity of using a polyvalent-type antigen in detecting the variant form of the disease were evident as a result of early studies of antigenic variants of the organism.

A serological procedure for differentiating the antigenic forms of *S. pullorum* was provided by Edwards and Bruner[2] in 1946. It was demonstrated that the antigenic differences between *S. pullorum* strains were dependent entirely on the degree of development of two antigenic factors which were designated XII_2 and XII_3 in accordance with the earlier report of Kauffmann[3] relative to form variation in antigen XII of the Kauffmann-White schema. Strains of the organism containing a well-developed XII_3 antigen were designated standard (S) types, while cultures existing in the XII_2 state were referred to as variant (V) types.

Since many strains did not exist as single-factor XII_2 or XII_3 forms, but rather exhibited a varying balance of both the XII_2 and XII_3 antigens, a third type was referred to as intermediate (I). The interpretation of the significance of the I type of *S. pullorum* has not been uniform among various workers in the field, as evidenced by the review of Snoeyenbos *et al.*[4] Blaxland[5] has reported that no great significance was attached to the I-type strains detected in England and Wales during recent surveys. He indicated that the preponderance of the XII_3 (S) factor in 256 intermediate strains, which were identified during a four-year period, insured that birds infected with these strains would be detected with standard-type antigen. Only 15 strains (2.2% of the total) isolated during the same period were classified as true variants. Likewise, Snoeyenbos *et al.*[6] have suggested that S- and I-type cultures be grouped together and designated "nonvariants" to distinguish them from typically V forms. Others, including the present writers, consider it of advantage to group V and well-balanced, I-type strains together as variant-factor cultures in view of the fact that I types possess the V antigen and are capable of stabilizing in the V form.

Based on the use of the single-factor XII_2 and XII_3 serums, Edwards and Bruner,[2] Wright and Edwards,[7] and Gwatkin[8] described procedures for serologically typing the cultures using the rapid, macroscopic, plate technique. These procedures have found wide application in research on the problem but have not been extensively employed for routine use by diagnostic laboratories. Considering the possibility that there might exist other differences in *S. pullorum* strains that could be correlated with serological variations, Gwatkin[9] tried unsuccessfully to differentiate the antigenic forms of the organism through the use of bacteriophage. Lederberg and Edwards[10] reported that they were unsuccessful in similar efforts. Gwatkin[11] found that homologous and heterologous serum-agar was of no value in differentiating the antigenic forms of the organism. The various antigenic types have exhibited no distinguishing cultural or biochemical characteristics.

In a previous report,[12] an ammonium sulfate-sedimentation test for differentiating the antigenic forms of the organism was described. The sedimentation test is based on earlier observations[13] that the S antigenic type of *S. pullorum* is more rapidly and completely flocculated and sedimented by lower concentrations of ammonium sulfate in aqueous solution than are V- and I-type cultures. The procedures originally described have been further studied and amended to render them more adaptable for routine use in the laboratory and are described in this paper.

From the Animal Disease and Parasite Research Branch, ARS, U. S. Department of Agriculture, Beltsville, Md.

PROCEDURE

Preliminary Identification of Cultures.—As in serological procedures, cultures to be typed by the sedimentation method are first identified as pure, smooth cultures of *S. pullorum*. Smoothness of the cultures may be confirmed by use of the Pampana acriflavine test,[16] by observation of growth in broth, or by examination of colonial forms.

Preparation of Cultures.—Following primary isolation, a fresh agar slant culture is prepared by evenly streaking the entire slant surface with the organisms. The slants are incubated for a minimum period of twenty-four hours at 37 C.

Any medium supporting abundant growth of the organisms may be used. Veal infusion agar (Difco Laboratories, No. B343) and thiosulfate-glycerin (TG) agar[16]* are among several mediums used satisfactorily for providing adequately dense suspensions of the organisms for typing. The agar is tubed before slanting in large agar tubes (150 mm. by 18 mm.) in approximately 12-cc. amounts.

Suspension of the Organisms.—Two bulging loopfuls of the growth are carefully collected from the agar slant surface and suspended in 0.5 cc. of 0.85 per cent saline solution containing 1.0 per cent formalin deposited in a chemically clean serological tube (100 mm. by 15 mm.). A loop prepared from 23-gauge wire having an internal diameter of 4 mm. is used for collecting and suspending the growth.

The organisms are easily suspended in the formolized saline by repeatedly touching the growth to the side of the tube just above the liquid level while holding the tube in an almost horizontal position. Frequent, gentle agitation of the tube will further aid in producing uniform suspension of the organisms. After both loopfuls of growth have been suspended, the tube is vigorously agitated to insure complete suspending of the organisms.

When this procedure is properly executed, the turbidity of the suspension will approximate 100 times tube No. 1 of the McFarland scale.[16] For standard reference a suspension of *S. pullorum* organisms having the above density is available from this laboratory.

Following suspension in formolized saline, the organisms may be killed by heating the capped tubes in flowing steam or boiling water for three minutes.

Preparation of the Ammonium Sulfate Test Solution.—Accurately weigh 330 Gm. of ammonium sulfate ($[NH_4]_2\ SO_4$), analytical reagent grade, and deposit it in a 1-liter, chemically clean, volumetric flask. Add distilled water to dissolve the salt and adjust the volume to 1 liter. Filter the solution through filter paper and store in a tightly stoppered container to prevent evaporation.

Addition of the Test Solution.—To each tube containing 0.5 cc. of the bacterial suspension, 8 cc. of ammonium sulfate solution are added using a chemically clean pipette. Following the addition of the ammonium sulfate solution, a uniform mixing of the organisms and test solution may be obtained by inverting several times.

Incubation of Tests.—The tubes are placed in a constant temperature water bath set at 55 C. and incubated for five minutes. The contents are then observed for cell flocculation. Most S strains of *S. pullorum* will reveal a marked flocculation when the tubes are viewed against a bright background, and I strains will reveal less marked flocculation than S strains, while V types usually reveal no flocculation.

Centrifugation and Interpretation of Results.—Following incubation, the tubes are centrifuged at 2,400 r.p.m. for fifteen minutes. Results of the tests are read against a bright background and are interpreted as follows:

S type—characterized by a clear supernatant fluid and sedimented cells packed in the bottom of the tube. A faint trace of turbidity may be observed in the supernatant fluid of some S-type cultures.

I type—characterized by a moderately turbid supernatant fluid with some sedimented cells packed in the bottom of the tube.

V type—characterized by a markedly turbid supernatant fluid with some cells packed in the bottom of the tube.

DISCUSSION

Information relative to the incidence and distribution of the antigenic types of *S. pullorum* is an essential part of the pullorum control program. The Committee on Standardization of Antigens and Procedures at the 1954 National Plans Conference[17] recommended that state laboratories should type or have typed all *S. pullorum* cultures isolated. Information derived from typing *S. pullorum* cultures is especially useful in those states in which only standard-type antigens are used in testing. The isolation of variant-factor strains of the organism from chicks or poults from breeding flocks or from reactor birds submitted for culture often affords the first indication of a variant problem in a flock and warrants consideration of the use of polyvalent-type antigens in eradicating the disease. Moreover, as the incidence of pullorum disease continues to decrease, the accumulation of more detailed information relative to the antigenic types of the organism is especially valuable.

Since no central laboratory has been established with the function of typing *S. pullorum* cultures, this responsibility has

*Directions for preparation of this medium are available from the Animal Disease and Parasite Research Branch, ARS, U. S. Department of Agriculture, Beltsville, Md.

rested for the most part with the individual state poultry diagnostic laboratories. For use in the average laboratory, serological procedures for typing *S. pullorum* cultures have certain limitations. The preparation, proper standardization, and maintenance of satisfactory typing serums require considerable experience as well as an appreciation of Salmonella serology. Interpretation of typing results among various laboratories may vary to a certain extent, depending on the titer of each lot of typing serum, quantity of culture used in the rapid, macroscopic test, and other factors that are not easily standardized. Furthermore, many laboratories do not encounter a large number of *S. pullorum* cultures and, therefore, do not consider the effort required to maintain a serological typing service to be worthwhile.

The limited number of published reports as reviewed by Snoeyenbos *et al.*[18] and the results of questionnaire surveys[19,20] reflect the scarcity of complete information on the distribution of the variant form of pullorum disease in the United States.

The sedimentation test for typing *S. pullorum* cultures as described in this paper provides a reliable and readily standardized procedure which is well suited for routine laboratory use. Through the maintenance of complete, up-to-date records by each state diagnostic laboratory relative to the incidence and distribution of antigenic types of *S. pullorum*, this important phase of pullorum control work will keep pace with other aspects of the program as presently administered under the National Poultry and Turkey Improvement Plans.

SUMMARY

A simplified sedimentation test for differentiating standard, variant, and intermediate antigenic types of *Salmonella pullorum* is described. The method is based on the relative flocculating and sedimenting effect of an aqueous solution of ammonium sulfate (330 Gm./liter) on suspensions of the organisms in formolized saline. The sedimentation test is more adaptable for routine use than conventional serological procedures and should encourage the more universal typing of *S. pullorum* cultures by poultry diagnostic laboratories.

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Turkey Ornithosis*

Turkey ornithosis, first diagnosed in a poultry-processing plant at Giddings, Texas, in 1948, is now present in ten or more states. A committee of 33 scientists has been established and, for over a year, has studied the problem. Dr. K. F. Meyer, director emeritus of the Hooper Foundation for Medical Research, University of California, San Francisco, is consultant to the committee. The following is Dr. Meyer's report of Jan. 17, 1955.

Dear Dr. Carpenter:

I wish to submit for consideration my reasons for recommending that the term "turkey ornithosis" be chosen to describe the nature of the recently discovered infection in this species of birds:

The term "psittacosis," derived from the Greek word "parrot," was suggested in 1895 by Morange to designate a peculiar contagious disease of man, which had been noted among members of households exposed to sick birds, primarily parrots, from foreign countries. This term, with its specific implications, was universally accepted until it was recognized after 1929 that the causative agent of psittacosis is merely a single member of a much larger group of agents which share certain biological properties. Among the members of this group are the well-known pneumonitis viruses (meningo-pneumonitis, mouse pneumonitis, feline pneumonitis, psittacosis, Louisiana and San Francisco viruses). The ability of these to produce pneumonia was considered all important. But knowledge advanced and it was learned that the group comprises also agents that infect mammals, producing generalized infection without pneumonic involvement. It is now customary to place all these diverse large and readily stained agents into the pneumonitis-psittacosis-lymphogranuloma venereum group. Newer studies on the antigenic structure have disclosed that the agents are species-specific in the toxin or viral neutralization tests (Meyer, "The Dynamics of Virus and Rickettsial Infections," 1954, p. 301). Thus today it is a generally accepted policy to report human infections associated with pneumonia according to their etiology, provided the infective agents have been isolated. The term "psittacosis" is reserved for infections specifically attributed to the agent transmitted from psittacine birds to man.

Since 1938 the epidemiologic relationship between human cases of "psittacosis" has assumed other aspects. Fulmars, pigeons, chickens, finches, ducks, pheasants and now turkeys have been recognized as potential sources of human pneumonia. The term "psittacosis" does not accurately describe infections derived from these birds because they are not members of the psittacine family. The more embracing term "ornithosis" (disease of birds) was proposed (Meyer, 1941). This term has found acceptance in the English, French, and German literature by authoritative investigators (Mackie, Hunter, and Worth, 1954; Bedson, 1950; Lepine, 1951; Mohr, 1952). They have all recommended *that the infection of any bird exclusive of psittacine species, caused by members of the pneumonitis-psittacosis-lymphogranuloma group, be designated as "ornithosis."* There is available convincing evidence that the viral agents causing the generalized infections with localization of the lesions in the parenchymatous organs and serous membranes are distinct serotypes characteristic for the different species of birds. The agent responsible for turkey ornithosis is quite distinct and is serologically separate from the agents causing infections in pigeons, parakeets, and parrots.

By adopting the term "turkey ornithosis," both in scientific and in lay publications, the differences in the epidemiologic pattern of the human disease are emphasized.

In the mind of the public the term "psittacosis" is associated with the illness which caused the pandemic of 1929 and 1930, with a mortality rate of from 20 to 50 per cent. It is doubtless not in the interest of the poultry industry to perpetuate this terrifying impression to the consumer of edible bird meat, particularly in view of the increased publicity being given to the problem of human psittacosis associated with the wide distribution of infected parakeets. Well-defined descriptive terminology is essential in interhuman communication.

The term "psittacosis of turkeys" is ambiguous and epidemiologically misleading.

The plea is here made that all workers in this field of research, official personnel, members of departments of agriculture, and persons associated with the poultry industry adopt the terms "turkey ornithosis," "pigeon ornithosis," or "chicken ornithosis" to describe the disease correctly.

Sincerely yours,
s/K. F. Meyer, M. D.

*Submitted for publication by Dr. Cliff D. Carpenter, president of the Institute of American Poultry Industries.

The Physical Examination of Rhesus Monkeys

Major W. H. DIETERICH, V.C., U.S. Army

New York, New York

THE FIRST ARMY Area Medical Laboratory, in New York City, recently agreed to perform for the School of Aviation Medicine, Randolph Air Force Base, Texas, the acceptance testing of Rhesus monkeys to be used by the latter. This was to be done upon arrival of the animals from India and was to include tuberculin testing; general examination for sex, weight, pulse, temperature, and external parasites; stethoscopic examination of heart and lungs; fecal examination for internal parasites; rectal swab culture for intestinal pathogens; and the tattooing of accepted monkeys.

RESTRAINT

The first problem was how the monkeys were to be caught and held while being examined. Five catching techniques and two holding methods were tried.

The only satisfactory method of holding was by hand (fig. 1), with the attendant grasping the monkey's arms and pinning them behind its back with one hand and holding the animal's head or hindlegs with the other. (Monkey handlers with large hands have less difficulty with their jobs.) For large monkeys, a second attendant held the hindlegs. With this method, the monkey could be held or turned in any direction desired, the disadvantage being the physical labor involved and the occasional danger of the holder being bitten or scratched.

Another method tried in an attempt to reduce the time and danger involved was a "squeeze box." The monkey was driven into the box head first, then one strong strap was pulled down over his back and fastened with a buckle, and a second strap was pulled down over his neck just above the shoulders. The monkey thus was held firmly in a crouch and the sides of the box, which were hinged, could be opened for access to the animal (fig. 2). The advantages of this method were the ease and speed of handling, while the disadvantages were the inaccessibility of the stomach and chest, except through holes cut in the floor of the box, and of the head and tail, except through the ends of the box which could be closed by sliding panels. In addition, several sizes of squeeze box were necessary—one to handle 6- to 10-lb. animals, another for those 9 to 13 lb., and the largest for those 12 to 18 lb.

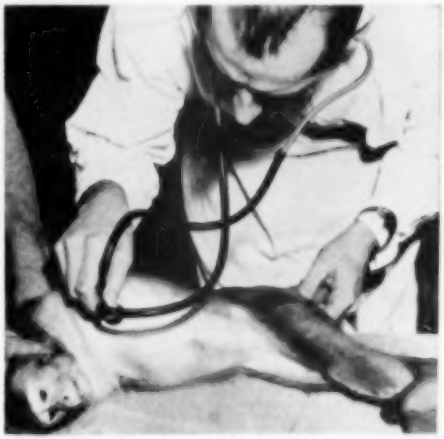


Fig. 1—Restraining monkey for physical examination.

Two other reported methods were not tried. The first, tying the animal down to a board, had the advantage of giving easy access to the ventral aspects of the animal with little or no danger to the operator, but fastening the monkey to the board required considerable time and trouble. The other method involved securing the animal in a net or sack through which injections or anesthesia could be administered; this, obviously, would be a handicap in making the physical examination.

One method of catching a monkey is to drive it from the large cage into a smaller cage or box, and from this into the catching net (fig. 3) or squeeze box. The problem is to move the monkeys down the partitioned crate into the net, since those with more experience or intuition resist the prodding and occasionally back into the net instead

This paper was read before a meeting on "The Veterinary Care of Laboratory Animals," July 19, 1953, Royal York Hotel, Toronto, Ont.

Major Dieterich (now lieutenant colonel) is now at the School of Public Health, University of Michigan, Ann Arbor.

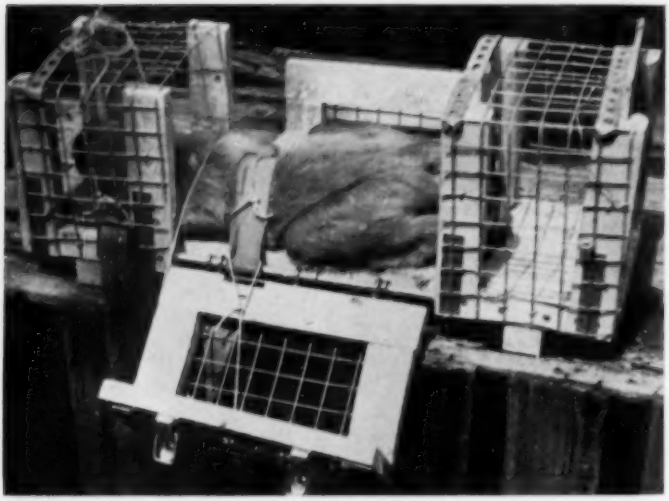


Fig. 2—Monkey fastened in squeeze box for examination.

of going in headfirst, creating a problem in removing them from the net.

The second method tried was the use of a chute, larger at one end, the last compartment of which would hold only 1 monkey, which was then driven into the net or box. This was a better method but still required considerable prodding of some animals. However, if the last compartment were darkened (the squeeze box, also, if used), the monkey would enter, apparently seeking a dark corner.

A third method was to drive them from the large crate into a smaller box or shipping crate. The door of the latter was then opened, the catching net (with a smaller wire and shorter handle than usual) inserted, and a monkey caught. This eliminated the necessity for prodding but required more dexterity on the part of the man handling the net.

A fourth method was to have the attendant climb into the large cage with his net, catch a monkey, and hand it out through the door. This required a minimum of handling and transferring of the monkeys and allowed a slightly better opportunity of selection when both sexes or several sizes were mixed, but increased the possibility of the attendant being bitten, scratched, or dirtied up, and of an animal escaping when the door was opened for the monkey to be handed out.

The fifth method required a fearless, experienced handler who would step into the large cage and catch the monkey with his bare or gloved hand (fig. 4). Grasping the back or loin, he immediately disengaged the monkey's hands with his free hand and pinned its arms behind its back. The Rhesus monkey is easily winded when kept in constant motion, so by following the selected animal until it tired, the task was considerably simplified, although more time was required. With the right man, this was the simplest and quickest, but the most dangerous.

Fig. 3—Removing monkey from catching net.

A method of catching monkeys in their permanent quarters was demonstrated at Northwestern University at the 1951 Animal Care Panel meeting. The trap-transport (fig. 5) was put before the door of the

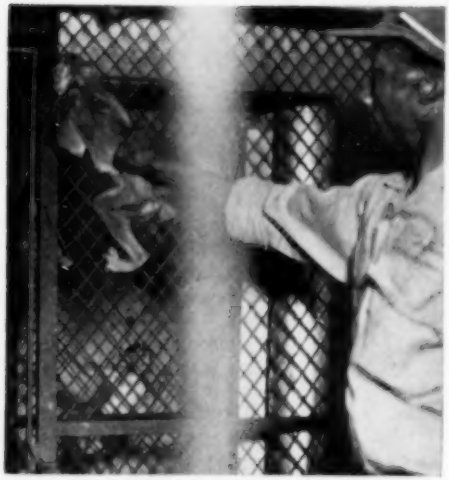


Fig. 4—Catching monkey by hand.

regular monkey cage, the door on each was opened, and the animal lured or driven into the carrying crate. In a very short time, monkeys had been trained to go into the smaller or carrying crate which was designed with an inner lining of linen or burlap which could be removed with the animal inside. This trapping procedure could be carried out by a single operator with a minimum of effort and a maximum of safety and efficiency.

PHYSICAL EXAMINATION

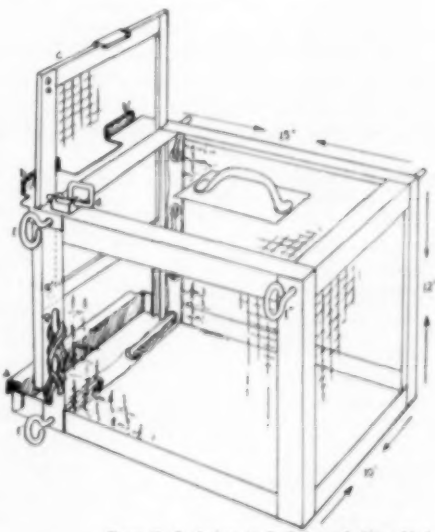
Since many of these animals had been flown directly from India within a few days of their capture, their physiology was understandably disturbed by the changes in environment, confinement, and food. Obviously their pulse, respiration, and temperatures would differ from those of quiet, acclimated, healthy animals. How much of the diarrhea could be attributed to fright, how much to changes in feed, and how much to disease was a question. Incidentally, the vendors had shipped the grain for the monkeys' trip from India. They found that the feed which would be best accepted and would least upset the digestion was a mixture of rice with wheat or barley. After their arrival and acclimatization, they were given fresh fruits and vegetables, but these invariably proved laxative, perhaps indicating that they were not normally a large part of the wild monkeys' diet.

PHYSICAL EXAMINATION FINDINGS

Pulse rates ranged from 90 to 280 with an average of 188, the rate varying directly with the amount of exercise just taken. Likewise, the respiration varied from 36 to 130, with an average of 73. The temperatures were surprising, ranging from 101.0 to 106.5 F., with an average of 103.5 F. The higher temperatures were at first believed to indicate disease, but each had been preceded by violent exercise, the monkey was otherwise apparently in good health, and subsequent temperatures were invariably lower, even after the tuberculin injection. Monkeys driven into catch cages averaged 0.6 degrees less temperature than those caught in a net or by hand. The 6 monkeys from a zoo averaged 101.8 and 101.2 F. on two trials, indicating the influence of acclimatization.

Of the 297 animals examined, only 1 had external parasites, and on it only 1 flea was found. Internal parasites found in the 149 animals from which stools could be collected are listed in table 1.

Stool cultures were made on 237 of the animals to investigate the normal intestinal flora of wild monkeys freshly arrived from India. The results are shown in table 2. The 202 animals which were positive had 238 organisms, an average of 1.18 species of organisms per animal.



—*From B. J. Cohen in J. Lab. and Clin. Med.*

Fig. 5—Trap-transport cage for monkeys.

The biggest problem, still not perfectly answered, was adequate testing against tuberculosis. An investigation revealed that different institutions were using different methods of tuberculin testing. Most were using the intrapalpebral test with the strength of the tuberculin ranging from 1:10,000 to full-strength old tuberculin (O.T.). A few were using a subcutaneous injection followed by temperature checking. Others were incorporating chest radiographs.

TABLE 1—Internal Parasites Found in the Stools of 149 Monkeys

Parasites	No.	Percentage of 149 examined
Hookworm ova or larvae	84	56.3
Endamoeba coli cysts	17	11.4
Trichomonas	16	10.7
Ciliated protozoa	15	10.0
Whipworm ova	4	2.6
Endamoeba nana cysts	2	1.3
Fasciolopsis sp.	1	0.7
Negative	20	13.4

It was decided to use, with the vendors' permission, a subcutaneous "shocking dose" of tuberculin which was supposed to make affected animals seriously ill, or even kill the advanced cases, while healthy animals would be unaffected. The dosage used was 0.1 ml. of a 1:100 dilution of Koch's O.T. per kilogram of body weight. (Thus each 0.1 ml. would contain 1.0 mg. of tuberculin and a 10-lb. monkey would receive 0.45 ml. of solution or 4.5 mg. of tuberculin.)

The results were inconclusive. All 297 animals were injected subcutaneously but none showed any ill-effects and temperature changes were insignificant. Monkeys caught by net averaged 103.7 F. on both first and second readings of the test (24-, 48-, and 72-hour periods making little difference); those driven through chutes averaged 103.0 F. on the first reading and 103.1 F. on the second; while the 6 monkeys returned from a zoo averaged 101.8 F. on the first and 101.2 F. on the second reading.

TABLE 2—Intestinal Flora Found in Stool Cultures of 237 Monkeys Newly Arrived from India

Intestinal pathogens	No.	Percentage of 237 examined
Shigella flexneri 3 (Shig. paradysenteriae Z)	7	2.9
Shig. flexneri 6 (Shig. paradysenteriae, Boyd 88)	7	2.9
Shig. alkalescens, type I	1	0.4
Salmonella sp.	4	1.6
Nonpathogenic intestinal flora		
Proteus mirabilis	56	23.6
P. morganii	36	15.1
P. vulgaris	26	10.9
P. rettgeri	3	1.2
Proteus, unspecified	23	9.7
Paracolon, unspecified	49	20.6
Candida krusei	12	5.0
C. tropicalis	3	1.2
Pseudomonas sp.	1	0.4
Culturally negative	35	14.7

Five of these tested animals subsequently died in Texas, 4 of which had shown positive tuberculin reactions when tested a second time one month after the first test (the intrapalpebral injection of 0.1 ml. of 1:10 dilution of O.T. was used for the second test). Confirmatory radiographs taken at this time showed lung changes in all 4. The radiological findings of slightly calcified lenticular lesions, 2 mm. in diameter, scattered throughout the lungs were confusing. However, pathologists claimed they were of parasitic origin which would seem to be supported by the fact that monkeys with tuberculosis usually die before there is time for calcification of the tuberculous lesions.

Because of these unsatisfactory results, the Veterinary Corps of the U.S. Air Force has embarked on a new routine of processing newly imported monkeys which includes: (1) a thirty-day quarantine in individual crates, (2) a 48-hour period with adequate water but a light diet and no human interference, and (3) then a physical examination including chest radiographs, check for parasites, weekly weight recording, and an intrapalpebral tuberculin test read in seventy-two hours.

Tuberculin reactors and animals with positive chest plates are to be destroyed immediately; suspicious reactors are to be isolated and retested at thirty-day intervals until positive or until negative on three successive tests (including radiographs); and groups with reactors or suspects are to be retested until negative on two successive tests.

All ailments are to be treated and, at the termination of quarantine, records are to be completed and the healthy animals tattooed and released.

SUMMARY

Methods of catching, handling, and examination of Rhesus monkeys for the purpose of detecting and eliminating any communicable disease or other condition which might render the animals unacceptable for purchase are discussed.

Use of a "shocking dose" of tuberculin failed to produce diagnostic signs of illness in monkeys which one month later reacted to the intrapalpebral test and revealed lung lesions.

An Unusual Case of Polydipsia and Polyuria in a Dog

E. F. REBER, Ph.D.; R. E. WITTER, D.V.M., M.S.; A. G. SCHILLER, D.V.M.; R. P. LINK, D.V.M., Ph.D.

Urbana, Illinois

A 9-month-old, male Doberman Pinscher, brought to the clinic in July, 1953, was believed to have a bacterial enteritis and rachitis. Treatment consisted of administration of an antibiotic and anti-distemper serum. The dog was released in 11 days but was readmitted two weeks later. He had lost weight, appeared emaciated, but had a good appetite. The hemoglobin value, white blood cell and differential counts were within standard values.[1] The serum calcium was 2 mg. and serum phosphorus 3 mg./100 ml. of blood. The specific gravity and pH of the urine were not unusual (table 1). Examinations for internal and external parasites were negative. Two days after the second admission, the dog was released and shipped to New York. He weighed 65 lb. when shipped.

On arrival, the dog had an excellent appetite, drank tremendous amounts of water and urinated frequently. He had a low urine specific gravity (table 1, Oct. 15), a temperature of 103.2 F., and was believed to have chronic interstitial nephritis. He was treated with 100 mg. of terramycin® on October 15 and again on October 16.

The dog was readmitted to the Illinois clinic on Oct. 22, 1953. His white blood cell and the differential counts as well as the blood calcium, were within the range of standard values, but the blood phosphorus was reported as 0.9 mg./100 ml. of blood. The urine volume, specific gravity, and pH were determined on 24-hour collections preserved under toluene. Urinalysis revealed nothing unusual except a low specific gravity (table 1, Oct. 23). On October 27, his weight was 53.5 lb. He drank and urinated excessively and had a good appetite, but appeared emaciated. He was nervous and shy. A blood sample was found to contain 5.3 mg. total phosphorus per 100 ml. of blood. The ring test for albumin and the ketone tests (qualitative) were negative for urine collected for the periods ending October 28, 29, and November 2. A qualitative test for calcium in the urine was positive on October 28 and negative on October 29 and November 2.

TABLE 1—The Volume, Specific Gravity, and pH of Urine and the Body Weight of a Dog with Polydipsia and Polyuria

Date (1953)		Volume (ml.)	Specific gravity	pH	Weight (lb.)
July	28	.....	1.046	acid	.....
August	21	.....	1.047	acid	.....
September	2	.....	1.036	acid	.....
September	22	.....	1.042	alkaline	.....
October	15	.....	1.010	5.5	65
October	23	.....	1.016	acid	.....
October	28	2,205	1.011	6.6	53.5
October	29	3,185	1.011	8.5	.....
October	30	1,800	.....	.....	.....
October	31	2,460	.....	.....	.....
November	1	2,750	.....	.....	.....
November	2	2,710	1.017	8.8	64
November	3	1,430	1.016	6.8	.....
November	4	1,005	1.016	6.8	65
November	5	745	1.019	6.9	.....
November	6	445	.....	.....	.....
November	10	710	.....	.....	.....
November	15	965	.....	.....	.....
November	16	1,600	.....	.....	67

The only treatment the dog received was intramuscular injections of posterior pituitary solution, U.S.P. for surgical use. He was given three injections of 0.5 ml., the equivalent of ten U.S.P. units, on October 30, 31, and November 1. The response was delayed, the urine volume decreasing and specific gravity increasing 72 to 96 hours after the initial injection, or 24 to 48 hours after the third injection. Usually, the response to a single treatment occurs within 24 hours. The dog gained weight rapidly following the first injection.

By February, 1955, the dog was in excellent health and condition and weighed 90 lb. There had been no therapy in the 15 months since he received the three injections of posterior pituitary solution. It was thought at first that this may have been a case of diabetes insipidus. The response to posterior pituitary injections is unusual. Was this a case of diabetes insipidus?

From the Department of Physiology and Pharmacology and the Department of Veterinary Clinical Medicine, College of Veterinary Medicine and Illinois Agricultural Experiment Station, Urbana.

[1]Albritton, E. C.: Standard Values in Blood W. B. Saunders Company, Philadelphia, 1952.

Tetracycline Therapy of Experimentally Induced Anthrax in Sheep

W. P. JOHNSON, D.V.M., and R. C. PERCIVAL, V.M.D.

Pearl River, New York

TREATMENT of both human and animal anthrax with various antibiotics is now widely practiced. Penicillin has been used most frequently, but relatively recent reports have directed attention to the effectiveness of chlortetracycline* and oxytetracycline,† not only as initial treatment but also where relapses have occurred following treatment with penicillin, or where penicillin has proved ineffective.[1-6] These reports are all concerned with natural outbreaks of anthrax.

To our knowledge, no controlled studies have been reported on the treatment of experimentally induced anthrax in sheep or other domestic animals, where the infectivity of the organism is known and a carefully regulated infection is produced. The purpose of the study reported in this paper was to determine the efficacy of tetracy-

TABLE 1—Tetracycline Therapy in Experimentally Induced Anthrax in Sheep Initiated Immediately Following Infection

	Tetracycline intramuscularly, 2 mg./lb. body wt. once every 24 hours for 3 treatments						No treatment							
Sheep	June 29		June 30		July 1		July 2		July 3		July 4		July 5	
No.	T*	S†	T	S	T	S	T	S	T	S	T	S	T	S
2007	2.6	1	4.0	2	4.0	2	3.0	1	2.6	1	2.0	1	2.8	1
2010	4.2	1	3.2	1	4.8	2	4.0	2	4.0	1	2.8	1	4.0	1
2033	4.6	1	4.6	2	3.8	2	4.6	2	4.0	1	4.0	1	4.0	1
2018	4.2	1	3.2	1	4.2	2	3.0	1	3.6	1	3.0	1	2.4	1
2026	4.4	1	3.0	1	4.0	2	3.8	2	2.6	1	2.4	1	2.4	1
UNTREATED CONTROLS														
2001	4.0	1	2.4	1	7.2	2,3	....	D	....	....	....	....	....	....
2004	4.4	1	3.2	1	....	D	....	....	....	....	....	....	....	....
2006	3.0	1	4.0	2	7.2	2,3	6.8	2,3,4	....	D	....	....	....	....
2012	3.2	1	3.6	2	7.4	2,3	7.0	2,3,4	....	D	....	....	....	....
2017	4.0	1	4.0	2	6.0	2,3,4	....	D	....	....	....	....	....	....

*Temperature. † 1 = Normal; 2 = off feed; 3 = respiratory involvement; 4 = prostrate; D = dead.

TABLE 2—Tetracycline Therapy in Experimentally Induced Anthrax in Sheep Initiated Twelve Hours Following Infection

	Infected 5 p.m.	Tetracycline intramuscularly, 2 mg./lb. body wt., once daily (5 a.m.) for 3 days						No treatment					
Sheep	July 8	July 9		July 10		July 11		July 12		July 13		July 14	
No.	T*	T	S†	T	S	T	S	T	S	T	S	T	S
1890	4.8	3.4	1	4.0	2	4.4	2	4.0	1	4.0	1	3.8	1
2020	4.8	3.6	1	3.6	2	4.0	1	4.2	1	4.6	1	3.2	1
2028	4.4	3.4	1	3.2	2	3.6	2	3.8	1	3.4	1	3.2	1
2029	4.2	3.6	1	4.6	2	4.2	2	4.4	1	4.2	1	3.4	1
2032	4.4	3.0	1	3.2	2	3.2	1	3.8	1	3.2	1	3.4	1
UNTREATED CONTROLS													
2015	4.2	3.4	1	6.8	2,3	....	D	....	....	....	....	....	....
2019	4.8	4.0	1	5.2	2,3	6.2	2,3,4	....	D	....	....	....	....
2030	4.8	2.8	1	6.6	2,3,4	....	D	....	....	....	....	....	....
2031	4.2	6.2	2	5.0	2,3,4	....	D	....	....	....	....	....	....
2035	4.6	3.4	1	3.0	2,3	4.8	2,3,4	....	D	....	....	....	....

*Temperature. † 1 = Normal; 2 = off feed; 3 = respiratory involvement; 4 = prostrate; D = dead.

Drs. Johnson and Percival are with the Clinical Research Section, Research Division, American Cyanamid Co., Lederle Laboratories, Pearl River, N. Y.

The authors express their appreciation to Mr. Robert Babcock for technical assistance in the conduct of the trial, and to Mrs. D. Budd for assistance in preparation of the manuscript.

*The trademarked name of American Cyanamid Co. for the antibiotic, chlortetracycline, is aureomycin.

†The trademarked name of Chas. Pfizer and Co. for the antibiotic, oxytetracycline, is terramycin.

TABLE 3—Tetracycline Therapy in Experimentally Induced Anthrax in Sheep Initiated Twenty-Four Hours Following Infection

Sheep No.	Sept. 8* T	Sept. 9 1†	Sept. 9 S‡	Sept. 10 T	Sept. 10 S	Sept. 11 T	Sept. 11 S	Sept. 12 T	Sept. 12 S	Sept. 13 T	Sept. 13 S	Sept. 14 T	Sept. 14 S	Sept. 15 T	Sept. 15 S	Sept. 16 T	Sept. 16 S	Sept. 17 T	Sept. 17 S	Sept. 18 T	Sept. 18 S	Sept. 19 T	Sept. 19 S	Sept. 20 T	Sept. 20 S	Sept. 21 T	Sept. 21 S
2008	5.6	3.8	1	4.0	1	4.4	2	4.4	2	3.4	1	4.0	2	7.2	2,3	6.0	2,3,4	4.2	2,3,4	—	D	—	—	—	—	—	—
2014	4.0	3.0	1	4.6	1	3.0	1	2.4	1	2.0	1	2.2	1	3.2	1	2.0	1	2.0	1	2.4	1	2.8	1	3.4	1	2.0	1
2027	3.6	3.2	1	4.0	1	3.4	1	3.0	1	2.4	1	3.8	1	3.8	1	4.0	1	3.6	1	3.4	1	3.2	1	4.0	1	2.2	1
2034	3.6	3.0	1	6.2	2	4.0	1	3.8	1	2.6	1	3.2	1	2.2	1	2.0	1	2.2	1	2.0	1	2.4	1	2.4	1	2.2	1
2798	4.4	4.0	1	6.8	2	3.8	1	3.2	1	4.2	1	2.6	1	3.2	1	2.0	1	2.8	1	2.8	1	2.6	1	2.8	1	2.0	1
UNTREATED CONTROLS																											
2002	4.4	6.6	2,3,4	—	D	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2036	4.0	3.6	2,3	6.0	2,3,4	—	D	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2037	5.0	4.0	2	6.0	2,3,4	3.8	2,3,4	—	D	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2707	4.6	3.4	—	3.0	—	6.8	—	—	D	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2799	4.4	4.0	1	3.2	2	4.6	2	4.6	2	6.8	2,3	4.2	2,3	4.0	2	4.4	2	4.2	2,3	4.6	2,3,4	6.8	2,3,4	—	D	—	—

*Infected at 8:30 a.m. †Single treatment at 8:30 a.m. ‡Observed at 4:00 p.m. T = Temperature; S: 1 = normal; 2 = off feed; 3 = respiratory involvement; 4 = prostrate; D = dead.

cline** in the treatment of such experimentally induced anthrax in sheep.

EXPERIMENTAL PROCEDURE

Two experiments were conducted to test the effectiveness of tetracycline administered in one intramuscular dose of 2 mg. per pound of body weight per day for three days, with treatment instituted at the time of, and twelve hours after, infection, respectively. A third experiment tested the efficacy of treatment using a single intramuscular dose of 2 mg. per pound administered twenty-four hours after experimental infection.

Thirty normal sheep, weighing approximately 100 lb., were used. The infective material consisted of a suspension of the "W" strain‡ of anthrax spores containing 70,000 spores/1 cc. One cubic centimeter of this inoculum was injected subcutaneously into the thoracic region of each sheep. A tetracycline intramuscular preparation was reconstituted with water for injection (U.S.P.), with a final concentration of 50 mg. of tetracycline/1 cc., and was injected deep in the muscle at the medial aspect of the thigh. Temperatures of all animals were recorded daily, and daily observations were made as to general appearance, activity, and feed consumption. No attempt was made to recover the organism from animals succumbing to infection.

Experiment 1.—Ten sheep were infected as described above. Five of the animals received an intramuscular dose of tetracycline at the rate of 2 mg. per pound of body weight immediately after infection, and at twenty-four and forty-eight hours postinfection for a total of three doses. The remaining 5 sheep were held as untreated controls.

As shown in table 1, temperatures of the treated sheep remained within the normal range. Inappetence was noted in 2 on the second day, in all 5 on the third day, and in 3 on the fourth day. Thereafter, all treated sheep were apparently normal through the seventh day when the test was terminated.

In contrast, severe symptoms and elevated temperatures were noted in all untreated controls by the third day, and all succumbed on the third, fourth, or fifth days.

Experiment 2.—This experiment duplicated experiment 1, with the exception that initial treatment was delayed until twelve hours postinfection. Table 2 indicates that almost identical results were obtained as when treatment was started immediately after infection.

Experiment 3.—As three doses, administered at 24-hour intervals, were effective in prevention of highly fatal, induced anthrax infection, the efficacy of a single dose was studied. Ten animals were infected as previously described, and 5 received

**The trademarked name of American Cyanamid Co. for the antibiotic, tetracycline, is polyotic.

‡This strain was received from Dr. R. A. Hendershott, Trenton, N. J., from an outbreak in mink which had been fed a carcass presumably dead of anthrax.

one intramuscular dose at the rate of 2 mg. per pound of body weight twenty-four hours after infection. In this instance, the observation period covered fourteen days.

In this experiment, 4 of the 5 treated animals remained normal throughout the test period, and temperatures were in the normal range (table 3). The fifth sheep, which had been infected on September 8 and treated on September 9, showed inappetence by September 11, severe symptoms by September 15, and died on September 18, the tenth day after infection. Four of the 5 controls died on the third, fourth and fifth days. The fifth control ran an atypical disease course, but death on the thirteenth day was typical of that seen in anthrax.

COMMENT

In all three tests, the results indicate that tetracycline is highly effective in preventing mortality from anthrax, even when administered twenty-four hours after infection. As it may be conjectured that the induced infection was considerably more severe than natural infection, a single treatment with tetracycline should give excellent results in the field.

SUMMARY

1) The effectiveness of tetracycline in the treatment of experimentally induced anthrax was studied.

2) Three doses of tetracycline (2 mg./lb. of body weight) administered intramuscularly immediately following and twelve hours postinfection, and then at 24-hour intervals, prevented infection in all sheep treated, as compared with death of all controls within three to five days.

3) One dose of tetracycline (2 mg./lb. of body weight), administered twenty-four hours postinfection, protected 4 of 5 infected sheep, while 5 untreated animals succumbed to infection.

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Growing Vesicular Stomatitis Virus

A method of growing vesicular stomatitis virus on guinea pig kidney cells, a method similar to that used in culturing the virus of poliomyelitis in man on monkey kidney cells for production of the Salk killed-virus vaccine, has been perfected at the U.S.D.A. Animal Disease Laboratory on Plum Island.

The vesicular stomatitis virus has also been grown on bovine tongue tissue, a method similar to that used in Europe for culturing foot-and-mouth disease virus. These advances should aid in the development of simpler and more rapid differential diagnostic methods for these diseases. The tissue-culture methods also should facilitate the production of antiviral vaccines. A new main laboratory under construction on Plum Island should allow fourfold expansion of the current program in 1956.—*Agric. Res., May, 1955.*

Brucella Melitensis in Eskimos

Two Eskimos from within the Arctic Circle, one adult and one child from different families, were found at a Canadian hospital to have *Brucella melitensis* infection. Since that organism is unusual in Canada and extraordinary in the Northwest Territories, it is surmised that the infection may have come with reindeer introduced from Lapland or from a possible natural infection in the musk ox or caribou.—*Canad. J. Pub. Health, April, 1955.*

Possible Enterotoxemia in Calves

On several farms, a number of 300- to 600-lb. calves, well fed or on full feed, died suddenly, having been ill only two or three hours. Others lingered for 48 to 72 hours. Sulfonamides, antibiotics, and serums were ineffective. Smears and cultures of the intestinal content showed a dominant organism resembling *Clostridium welchii,* and filtrates were lethal to mice. Of 3 calves given 30 to 40 ml. of *Clostridium perfringens* type D antitoxin, 1 died in five hours, the other 2 were markedly improved in 24 hours and apparently normal in 72 hours. The balance of the herd was then given 5 ml. of *Clostridium perfringens* type D bacterin.—*Vet. Scope, Spring, 1955.*

What Is Your Diagnosis?

Radiograph Offered for Your Study and Diagnosis

Make your diagnosis from the picture below — then turn the page ▶

Figure 1

History.—A herd of 15 pigs, 4 months old, were growing and developing well when they began to exhibit a reduced appetite. The pigs appeared normal but they approached their feed reluctantly, giving the impression of having sore mouths. No lesions were visible in or around the mouth but the snout seemed slightly enlarged and wrinkled. Radiographs were taken of the head of 1 pig.

Diagnosis and findings are reported on next page.

Here Is the Diagnosis

(*Continued from preceding page*)

Diagnosis.—Atrophic rhinitis.

Comment.—Notice the absence of the osseous structures of the palate, septum, turbinates, and nasal bones (fig. 1). Figure 2 is a radiograph of the head of a normal pig of similar age with the bony structure showing distinctly.

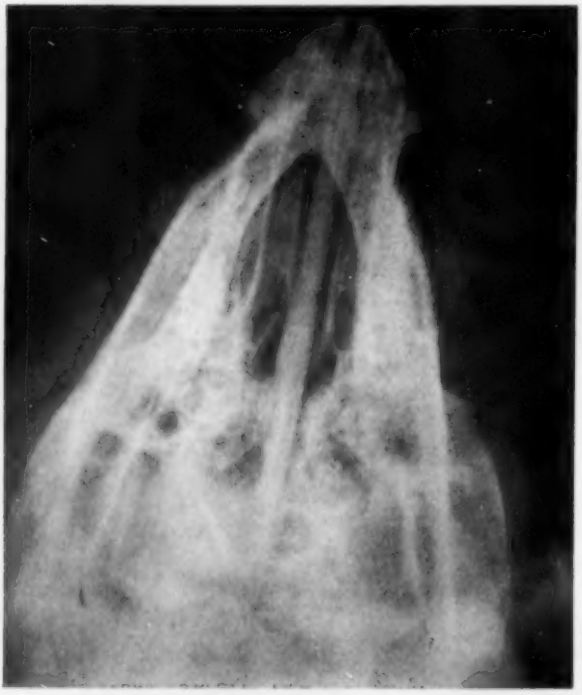

Fig. 2—The head of a normal pig of similar age as pig shown in figure 1.

This case was submitted by Drs. John P. Manning, Harry Hardenbrook, and Lloyd E. Boley, Department of Clinics, School of Veterinary Medicine, University of Illinois, Urbana.

Our readers are invited to submit case histories, radiographs, and diagnoses of interesting cases which are suitable for publication.

Inframandibular Diseases of Cattle

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Vicksburg, Mississippi

Inframandibular swellings in cattle may arise from several specific causes, two of which will be discussed. The most common is that associated with anemia resulting from parasitism and which is variously described as "bottle jaw" or "poverty disease." This is essentially a noninflammatory edema of the subcutaneous tissue. Tapping the swelling with a large-bore needle will release a typical, nearly clear and odorless fluid drip. It is seen more commonly in younger cattle which are in poor condition. The animal usually has no fever but frequently has diarrhea and pale mucous membranes. It is often heavily infested with lice and with internal parasites. The ration is usually inadequate.

Infectious inframandibular phlegmon, often called "fowl jaw," is a less common condition that might be confused with the above. It is a sporadic disease affecting cattle of any age and without regard to the state of nutrition or parasitism. Like the first condition, it is characterized by a diffuse swelling, but it is more acute. The animal may stop eating and the temperature is usually 104 F. or higher. On exploratory puncture a foul, sanguineous fluid with an offensive odor exudes from the subcutaneous tissue. This tissue seems to become semigangrenous although the regional skin and underlying musculature may remain normal. If untreated, some of these animals die in two or three days while others may live for several weeks. If not overwhelmed early by the infection, the animal may retain its appetite while the swelling gradually extends down the neck. Abscesses may form if the course of the disease is protracted.

This disease formerly was practically 100 per cent fatal, but now, with adequate sulfonamide therapy,[1-3] most of the affected animals will recover. It is advisable to make one or more incisions into the swelling to facilitate seepage of the infectious material and any abscesses should be opened for drainage. Sulfamerazine, sulfasoxazole, and combinations of these as well as combinations of sulfathiazole, sulfapyridine, and sulfamethazine have been effective when given in five-day courses of approximately 1 gr. per pound of body weight daily. Usually on the first day up to 2 gr. per pound is given, part orally and part parenterally. The sulfonamide therapy sometimes must be repeated after an interval of five days.

This infection is apparently due to a specific Streptococcus organism which produces a diffuse septic inflammation of the fascia. In differential diagnosis, actinomycosis, snake bite, inflammation of the salivary glands, and possibly anthrax should be considered. In salivary gland infections there is often drooling or profuse salivation and the swelling is apt to be more unilateral. An exploratory puncture will reveal the nature of the disease since foul jaw has a distinctive odor.

The references cited plus my own experience indicate a rather wide geographic distribution of foul jaw. The first three of the following cases were seen in Indiana, the other three in Mississippi.

Case Reports.—In 1934, a Shorthorn bull was not eating, had a submandibular swelling, and a temperature of 104 F. He was treated with an iodine ointment locally and a purgative. He died five days after onset of symptoms.

In 1936, a cow which had been affected two or three weeks had a swelling which had started in the submandibular region and had gravitated along the ventral surface of neck to the sternum. An extensive subcutaneous necrosis and suppuration was present, with numerous openings for drainage. She was still eating. Because of the odor and flies, the cow was tied in a clump of trees some distance from the barn. No treatment was attempted. Death occurred about thirty days after the swelling was first noticed.

In 1939, a cow had a poor appetite, a temperature of 106 F., and a submandibular swelling of about one week's duration. The swelling showed sublingually as well as externally. When tapped with a 14-gauge needle an offensive gray- to straw-colored fluid escaped from both the sublingual and submandibular tissues. She was treated locally and with hot and cold packs and numerous punctures were made in the swelling to provide drainage. She died after a few days of treatment.

In 1947, a cow had a temperature of

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about 105 F., anorexia, agalactia, and a submandibular swelling containing fetid fluid. She was treated with sulfamerazine and a few sulfanilamide boluses but subsequently died. The dosage was probably inadequate.

In 1948, an 800-lb., thin, grade beef cow with a 3-month-old calf was my first successfully treated case. She was gaunt, ate little, and was not giving much milk, but she was bright-eyed and alert. Her temperature was about 105 F. The submandibular swelling yielded the typical fetid fluid when tapped. The cow was given 0.5 oz. each of sodium sulfathiazole and sodium sulfapyradine in 500 cc. of water intravenously, 75 cc. of a 25 per cent solution of sodium sulfamethazine intramuscularly, and approximately 800 gr. of sulfamerazine in gelatin capsules orally. She was given 800 gr. of sulfamerazine daily for each of the next four days and recovered.

Since 1948, approximately 1 such case per year has been similarly treated and all have recovered. One had a relapse but recovered following a second five-day course of treatment. One advanced case was not treated.

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Effect of Pastures on Parasites

Bovine endoparasites, which are a serious problem in southern areas where the climate favors winter grazing, were investigated at two state experiment stations. In a four-year study in Georgia, calves on fescue pasture suffered more from parasitism than those on clover, partly due to the lower nutritional level. On both pastures, calves fared better when fed a corn supplement. Spring calves were more seriously infected than fall calves. In Mississippi, one fescue and one rye grass pasture were grazed at capacity from December through April by naturally infected steers which were then removed. When the pastures were examined monthly for the next four months, 8 times as many larvae were found in the fescue as in the rye grass pasture, probably because the fescue, which remained green, gave better protection to the larvae.—*E. I. Du Pont de Nemours and Co. Release, March, 1955.*

Extending the Action of Cortisone

Patients with rheumatoid arthritis, who received routine doses of cortisone acetate for one to two weeks after which the dosage was reduced, usually experienced a relapse within a few days. When sodium or potassium para-aminobenzoate in water was given one hour prior to each dose of cortisone acetate, comparable improvement was obtained with much smaller doses of the cortisone.—*M. Times, April, 1955.*

Three-Day "Stiff Sickness" in Africa

A virus disease of cattle called three-day "stiff sickness" often causes serious economic losses in dairy herds and in other cattle, especially when they are in poor condition. Affected cows show an initial high temperature, rapid labored breathing, depression, variable digestive disturbances, muscular tremors in most cases, varying degrees of mastitis without bacterial infection, and tenderness of the feet, sometimes with a distinct coronitis. Animals with severe cases may be unable to stand as long as 59 days before death. Some, apparently recovered, develop a progressive muscular atrophy, eventually becoming walking skeletons.

Since the virus is found in the blood but not in the urine or feces, it is probably transmitted by a biting insect. In experimental cases, the incubation period is two to six days; the immunity produced lasts about six weeks (in Australia, it apparently lasts two years). The disease has been present in Africa many years and, as in bluetongue in sheep, several types of the virus exist. The disease is not affected by the common antibiotics but intravenous glucose with cortisone seems to hasten recovery.—*J. South Afric. Vet. M. A., March, 1955.*

Vesicular Exanthema Virus Studies.—Cross-immunity tests indicated the existence of five strains of VE virus. Serum from hyperimmunized pigs can be used in complement-fixation tests for diagnosis and for type differentiation.—*Vet. Bull., April, 1955.*

NUTRITION

Mild Iodine Deficiency and Losses of Newborn Pigs

E. E. SLATTER, D.V.M.

Danville, Illinois

NEARLY EVERY spring, abortions, stillbirths, and weak pigs occur in a few swine herds. While there are other causes, I found that often it was due to a nutritional deficiency —a mild lack of iodine (simple goiter). Clinical observations have been confirmed by laboratory diagnosis.

Discussions of baby pig losses that have come to my attention in veterinary literature in recent years have failed to mention iodine deficiency as a possible factor. However, my experience has indicated that it is of considerable economic importance in this area (130 miles south of Lake Michigan). This is not one of the areas generally accepted as a "goiter belt" or as "iodine deficient," where the conditions expected are severe enough that the symptoms are easily recognized. Therefore, it should be clearly understood that this is a discussion of marginal or mild iodine deficiency only.

Usual discussions of iodine deficiency, although generally suggesting the possibility of milder symptoms, tend to leave the impression that hairlessness and goiter are the only ill-effects of the condition. Dr. John M. Evvard[1] of Iowa State College recognized this in 1928 when he stated:

> It is unfortunate that many authorities in the animal production field are still emphasizing hairlessness and "big neck" of the newborn as sole and distinctive symptoms of goiter. Although we are thankful for such outstanding signs (so that we know where iodine must be given), many cases of iodine shortage, not so distinguished or recognized, are being wrongly diagnosed, hence progress in the promotion of animal health is hindered. . . Alopecia adnata (hairlessness) in the young swine is now being widely prevented when the cause is of nutritional origin, this by the feeding of an idoine carrier. To infer, however, that an iodine deficiency is not being experienced in swine herds, if hairless or semihaired newborn pigs are not evidenced, is illogical. Well-haired pigs may, in our judgment, be the rule at farrowing time, and yet, there may be an insufficiency of iodine for normal metabolism.

We still believe, over 25 years later, that the above is true. However, less appropriate now is his statement that:

> In the present state of our knowledge, we do not have any practical way of knowing exactly whether or not any specific farm is laboring, from the swine standpoint, under iodine deficiency.

While it is difficult to make a clinical diagnosis of mild iodine deficiency in baby pigs from symptoms and necropsies, the State Diagnostic Laboratory can help if specimens are submitted to it with a good history. The work of the laboratory involves the sectioning, staining, and microscopic examination of the thyroid glands to detect abnormalities and the presence of colloidal iodine.

DIFFERENTIAL DIAGNOSIS

Evvard[1] also spoke of ". . .many cases of iodine shortage. . .being wrongly diagnosed. . ." At present, leptospirosis is often the suspected cause of premature or weak pigs, yet the laboratory diagnosis is negative. In that case, even though the present means of diagnosing leptospirosis by culture and serological methods have not been too accurate,[2] I suggest that a mild iodine deficiency may have been a factor. I have had the experience of encountering leptospirosis on a large swine-breeding farm where losses from iodine deficiency had occurred two years previously. Because of the similarity of symptoms, the farm manager thought it was the same nutritional deficiency previously experenced. The main difference was that the pigs were a little more premature and the sows were off-feed

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The author appreciates the aid of the Chilean Iodine Educational Bureau of New York and Chicago in supplying literature and references, and the help of Dr. Paul D. Beamer, University of Illinois, Urbana, in checking the manuscript.

for about 24 hours. Before leptospirosis was a recognized problem, such herds were often tested for brucellosis with negative results.

With a mild iodine deficiency, all pigs in a few litters may be born prematurely or dead but usually some are born alive, or all may be born alive with some or all being weak although they may appear well developed. The term, "squealers," applied after repeated experiences with iodine-deficient pigs, probably describes best the condition that we have encountered. The pigs are too weak to nurse so they lie and make aimless movements. Their weak squeal is characteristic.

The large animal clinician can make a fairly accurate clinical diagnosis of mild iodine deficiency from the history and symptoms without laboratory help, after it is established that the deficiency exists in the area. The degree to which the pigs respond to iodine therapy is also a diagnostic aid since the condition may be overcome in less than a week.

A report[3] from Purdue University in 1948, on pigs and lambs, indicates that rations commonly fed on Indiana farms can be deficient in iodine. Also, "in other areas which have been described as goiterous for man, but in which clinical evidences of iodine deficiency in livestock have not been reported, it would seem wise to further investigate the problem in farm animals." There are areas where simple goiter is found in human beings but has not been reported in animals.

IODINE-DEFICIENCY AREAS

Apparently, the usual information about the goiter belt areas needs to be revised. It is commonly believed that coastal areas are free of goiter because they are near the sea. However, the earth's crust, and not the sea, is the main storehouse for iodine. The element is taken up from the soil by the water and plants and is thus made available to animals.

Recent limited surveys by the American Public Health Service show a high incidence of goiter in Georgia and Florida. South Carolina is known to be well supplied with iodine. Generally, the cotton- and tobacco-growing areas of the south are considered goiter-free. The corn belt states may be considered mildly deficient, but more work must be done to classify such areas. Apparently, extensive areas in Canada are at least mildly deficient.

Because mild iodine deficiency, or simple goiter, is more recognizable in man, it would seem advisable for veterinarians to contact local physicians and study the findings of the American Public Health Service and of the medical profession in general for indications as to where to expect to find this deficiency.

Perhaps we practitioners in the area around Lake Michigan should be more alert to the possibility of a mild iodine deficiency. However, having in mind the symptoms of severe deficiency and seeing few of them, we are apt to overlook the possibility of milder consequences. We must realize that there can be all degrees of any deficiency conditions with the symptoms varying accordingly. There is no sharp line of demarcation between animals which have and those which have not adequate supplies of iodine.

CLINICAL OCCURRENCE

I have seen clinical iodine deficiencies nearly every year, but only in the late winter or spring. Apparently, the pregnant sow is able to obtain some of her iodine requirement directly from the soil. Therefore, when the ground is frozen or when she is confined on floors, she is deprived of this source for periods long enough to result in a noticeable deficiency unless her ration is supplemented.

Similar observations have been reported from Canada,[4] most frequently during indoor feeding periods, and from Purdue University[3]. However, one group of fall-bred sows, reported to have been on pasture during the spring and summer, was confined to gravel lots or concrete platforms with no iodine supplement during the greater part of their gestation period. As the farrowing season progessed, from November 20 to February 15, indications of thyroid deficiency became more severe. This instance was earlier in the season than I have observed it to occur, but it demonstrates that, under confinement and without iodine supplement, the condition may be experienced any season of the year. Not every farm is affected and, suprisingly, it is usually the better farmers that have the most trouble. Their better sanitation may deprive the sow of her usual source of iodine, yet they may neglect to provide

iodine, either in the salt or in other mineral supplements.

In affected herds, the rations fed were generally good except for lack of iodine supplements. Several herds were getting large amounts of dairy by-products and most were getting commercial sow supplements and corn. Deficiency occurred in one herd fed ear corn and commercial supplement daily, with iodine in the salt and in the complex mineral. However, both mixtures were in the form of solid blocks and not enough was eaten. The first three litters were born prematurely and dead, but after the sows had been properly medicated, all of the pigs were born healthy. On one large farm where the lack of iodine was suspected, I was informed that the sows were receiving eight times the required amounts of iodine. Later, it was found that the preparation used in the rations (iodized calcium) was unstable.

THERAPY AND CONTROL

Control of simple iodine deficiency is easily accomplished by supplementing the ration with the necessary element. Sodium or potassium iodide, or the newer organic iodide, may be used. I prepare a fresh solution for the client to use and prescribe 15 to 30 gr. in the feed daily per gilt or sow for three or four days. After this initial medication, the iodine level is maintained through use of iodized salt or a good complex mineral preparation.

In my experience, there is usually an interval of a few days after medication is started when no litters arrive, but all litters seem stronger and healthier when parturitions resume. It is gratifying to see the increase in vigor in these pigs.

When an iodine deficiency is found on a farm, it is recommended that the animals of all species receive suitable iodine supplement. They too may have a mild deficiency and supplying iodine should improve their general health, their productivity, and their resistance to disease. The commonly recommended use of iodine only in the latter part of gestation is inadequate.

Six possible reasons for an apparent increase in iodine deficiency, in spite of modern husbandry methods, are suggested here:

1) The breeders, in an effort to "save more pigs," may be more inclined to call for veterinary assistance, resulting in more cases being recognized than previously.

2) Because of an increased feeding of proteins, more iodine may be required to maintain proper metabolism.[4]

3) A wrong proportion of minerals or other ration ingredients could increase the demand for iodine, thus, the requirements would vary with different rations. Some items, classed as goitrogenic, show that effect only when not used in recommended proportions. Soybean oil meal is goitrogenic[5] if used in excess. In the Purdue experiments,[6] one lot receiving 10 per cent of the ration as soybean oil meal (no tankage) showed a markedly higher deficiency than did lots receiving tankage. This probably demonstrates the goitrogenic factor, although it was not designated as such in the report. Too much calcium in the human diet is said to increase the need of iodine and, no doubt, works similarly in livestock. Therefore, the liberal use of limestone out of proportion to phosphorus, because the former is cheap, should be discouraged.

4) Modern soil-fertilization methods make it necessary to increase the iodine in rations. Iodine is more easily liberated for plant use when the soil is acid; liming the soil lowers iodine availability. Where Chile saltpeter is used as a fertilizer, the iodine content in crops is greatly increased.

5) Confinement of swine on artificially surfaced lots, as previously mentioned, is a factor since it largely eliminates contact with the soil as a source of iodine.

6) There is evidence to indicate that some new standard daily requirements need to be established on the new lines of faster growing and better producing livestock now being developed. The thyroid gland, in particular, must certainly be called upon much more urgently for the production of the substances that go to make up the bodies and functions of our modern animals.

CONCLUSION

We need to recognize that progressive measures may have disadvantages. Sanitation is important and I certainly do not disapprove of the use of calcium and soybean oil meal, since the need for calcium is well-known and soybean oil meal, as a protein supplement, is a good source of three amino acids which are normally deficient in grains.

Nevertheless, I hope that I have indicated the apparent need of increased iodine supplement in livestock rations. Additional iodine must be provided regularly in many regions. Furthermore, if we recommend the use of iodized salt, we must be sure that the salt is actually iodized. Very little white salt used for animals, and only 50

per cent of salt prepared for human use, is iodized.[7] We have observed little indication that the iodine content of iodized salt, now on the market, need be increased. This is also true of the mineral supplements which are generally recommended by the veterinary profession. It is important, however, to see that the iodine-containing products available are used more regularly.

A word of caution may be appropriate — "overdoing it" by feeding too much iodine may have harmful results. This is particularly true in the case of the inorganic iodides. Large doses of the newer organic iodides are often used in the treatment of various conditions, without detrimental results. Whichever chemical produces the desired results most economically may be used.

SUMMARY

The extent of the goiter belt and marginal iodine-deficient areas should be restudied.

Mild iodine deficiency is a variable condition which does not occur consistently and, therefore, may be easily overlooked.

Modern trends in feeding and management have tended to increase the iodine requirement.

Iodine deficiency may be readily overcome by heavy doses of iodine for a few days, followed by continual use of iodized salt or a satisfactory complex mineral preparation.

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Vitamin B_6 and Heat-Sterilized Milk.— About one half of the biologically available vitamin B_6 in fresh milk is lost in the heat-processing of canned liquid milk. The commercial sterilization employs temperatures of about 240 F. for five to thirty minutes. —*J. Agric. and Food Chem., April, 1955.*

Effect of Feeding Sodium Acetate

Acetates, normally produced in rumen fermentation, are believed to have an essential role in the synthesis of milk fats. Also, sodium acetate, used in ketosis therapy, has seemed to be associated with blood sugar increase and blood ketone decrease. When 18 normal cows were given 1 lb. of sodium acetate daily for six days, either in feed or in capsules, no significant differences occurred in milk fat tests, total milk or fat production, blood glucose or blood ketone levels. Minimum levels of acetate may be required but excessive amounts are not beneficial.—*J. Dai. Sci., March, 1955.*

Feeding Hormones Alters Carcasses

At Purdue University, 2-year-old steers in groups of 10, fed 10 mg. per day of the synthetic hormones (stilbestrol, dienestrol, or hexestrol, respectively) for 123 days, averaged a total gain of 39 to 52 lb. more than controlled steers, and they required 9 to 12 per cent less feed per unit of gain. However, their carcasses graded slightly inferior to the controls and they showed a slight increase of teat length, some elevation of the tailhead, and a relaxation of the lumbar vertebrae. Their meat did not reveal significant estrogenic activity when tested on mice.—*J. Anim. Sci., May, 1955.*

Effect of High Salt Intake on Growth

When sheep were fed sodium chloride levels of 0.66 to 12.8 per cent of the ration at the University of California, the average daily gains, efficiency of feed utilization, and carcass grade were not affected. The weight of the kidneys increased at the higher levels. The number of stomach worms was not influenced. Salt intake up to 9.33 per cent also had no detrimental influence on the gains, feeding efficiency, or dressing percentage of calves.—*J. Anim. Sci., May, 1955.*

EDITORIAL

Where Veterinary Medicine Is New

Historians can point to medical treatment being administered to animals many centuries ago. This is attested by the name of our profession, "veterinary," which stemmed from *veterina* meaning a beast of burden. The latter explains the occasional suggestion that the profession's name be changed since modern methods in this country have practically eliminated "beasts of burden."

However, in many parts of the world modern veterinary medicine is in its infancy. Recently, the head[1] of the Veterinary Section of the Point Four Mission in Iran presented a report on the development of veterinary science in that country. This report should be of interest to all of us, not because of its peculiarities but because it may indicate the need for such developments in many sections of the world.

According to this report, Iran, with an area of about 515,000 square miles, or twice the size of Texas, has a population of 33,700,000 large domesticated animals. Of these, half are sheep while the balance consists of about 10,000,000 goats, 5,000,000 cattle, 1,500,000 asses, 500,000 horses and mules, 52,000 camels, and 13,000 swine. The poultry maximum is about 160,000,000 during the production season. About 80 per cent of the people are engaged in some form of agriculture, and nearly all of these have their primary source of income from livestock.

Because of the limited vegetation in most parts of Iran, flocks are continually on the move during the grazing season. Only in fertile valleys is grain-raising dominant. In the limited swampy areas where the flocks are more stationary, parasitic diseases abound. Nevertheless, as recently as 1924, anthrax was the only disease appreciated. In that year, a disease with a high mortality continued unabated after animals were vaccinated for anthrax. It proved to be rinderpest.

[1]Dr. Charles E. Pegg (COL '40), since August, 1953, has been head of the Veterinary Section, United States Operation Mission to Iran.

ORGANIZATION

Following this outbreak, and with government collaboration, the Pasteur Institute in Iran started preparing rinderpest vaccine and training vaccinator technicians. In 1926, the employment of a veterinarian from the United States for a three-year period, to establish a disease control organization, was authorized but nothing came of it. In 1929, a French veterinarian was employed for a few years to survey the problem. In 1934, another French veterinarian was made advisor to the national Vaccine and Serum Institute and six other European veterinarians were employed for three years as advisors at the ostan(province) level.

In 1928, the government instituted a program of sending 100 students to Europe annually for various types of technical training, two matriculating in veterinary medical courses each year. The Iranian army also sent a few men for veterinary training each year. Interest in establishing a veterinary service in Iran gained momentum as these trainees returned.

In 1933, a veterinary high school was established and the next year it became known as a veterinary college. Now, the Tehran Veterinary College gives a five-year course and has a faculty of 15 professors and 17 assistants. There are at present 139 students, 12 of whom are women.

In 1935, an animal inspection law gave the Ministry of Agriculture a means of controlling meat products. In 1946, a general livestock department was created, under the Ministry of Agriculture, consisting of a Livestock Disease Section, a Quarantine Section, Food Inspection, and other sections. In 1949, Iran joined the World Health Organization, Food and Agricultural Organization, and the International Bureau of Epizootics.

In 1937, the government established a General Veterinary Department independent of the other government agencies, and new veterinary graduates and technicians were assigned to newly created disease con-

trol positions at the province level. Many of these worked as mobile teams.

VETERINARY SERVICES

Many beneficiaries of the veterinary services opposed the program at first. However, the teams, consisting of a veterinarian to do the diagnosing and directing and technicians to do the treating and vaccinating, which were at first tolerated, are now welcomed.

In 1951, through the Point Four program, our government established the Division of Agriculture, United States Operations Mission to Iran, with branch offices in each of the ten provinces.

The veterinary section of the U.S.O.M.I. cooperates in providing a more complete veterinary service throughout the country. The basic objective is to accelerate the field team activities, to expand the laboratory diagnostic services, and to increase the production of biological agents.

As far as possible, one Iranian veterinarian is now assigned to each shahrestan (a district within a province), and the field team activities in his district are largely under his supervision. The field teams vary in size. Some are animal-mounted, some motorized. The former usually consists of two men, one a technician. The motorized teams use motorcycles with or without sidecars, jeeps, or pick-up trucks, and often consist of a veterinarian, two vaccinator technicians, and a driver. In 1953 there were 40 field teams, in 1955, 76 teams.

Team activities include chiefly vaccination against enzootic diseases and treatment of parasitic and other diseases. Foot-and-mouth disease, which is quite well established, is perhaps the most important disease at present. To protect the foundation stock which has been imported from America, foot-and-mouth disease vaccine (30,750 doses) has been imported from Holland. By 1956, sufficient vaccine may be produced locally.

In the year ending March 21, 1955, nearly 14,000,000 animals were vaccinated for one or more of ten diseases. This included over 10,000,000 for anthrax, 492,000 for blackleg, 826,000 for enterotoxemia, 468,000 for sheep pox, and 220,000 for Newcastle disease. The benefits of the annual vaccination program may be indicated by reports from Tehran Province where the number of animals slaughtered increased from less than 8,000,000 in 1950 to 15,500,000 in 1954, while the cases of human anthrax decreased from 180 to five in the same period.

PRACTITIONERS

It is believed that the first person to engage in private veterinary practice in Iran was a physician who, in 1911, after studying French veterinary textbooks, combined practice with slaughterhouse inspection service in Tehran. However, the first well-established private practice was started, also in Tehran, in 1937 by a clinician on the college staff. At present, this clinic averages about 100 in-patients and out-patients, all large animals, each week. Several other clinics and small animal hospitals have been opened, but the opportunities are considerably limited by the government's complete disease control service.

At present there are no laws governing the control of tuberculosis or brucellosis but committees are studying the problem.

Bovine Ketosis

The lead article in this issue of the JOURNAL is concerned with one of the most controversial current veterinary disease problems—bovine ketosis. Although discussed for about three decades, the actual cause has not been determined, so several schools of thought regarding the disease exist.

Bovine ketosis is a major problem in many dairy herds but it seems not to occur universally. Why? Being confined largely to high-producing cows in herds which follow intensified production practices, does it indicate that these animals have been pushed to a point of diminishing return? Or, being reported chiefly from the Great Lakes and coastal regions, could it be that the methods of confinement, or of feeding, or variations in the nutrients in the feed might be responsible factors?

Ketosis is a condition which apparently can well be explained by the "stress" theory, yet the factors responsible for the stress must be identified to be of practical value.

Dr. Vigue's article is the culmination of about seven years of work with hundreds of field cases, supplemented by an amount of research which is quite exceptional for a practitioner to undertake. It reports suffi-

ciently well-controlled experimental findings to be eligible for publication in the *American Journal of Veterinary Research* but, because of its practical aspects and in spite of its length, it was assigned to the JOURNAL where it will be available to the practitioners. Because of its broad coverage of the problem of bovine ketosis it deserves careful study.

Professor E. Leclainche 1862—1953

About a year and a half after his passing, the Association was advised of the death of Professor Auguste Louis Emmanuel Leclainche, noted former chief of the livestock sanitary service of France, later founder and director of the International Office of Epizootics in Paris, and an honorary member of the AVMA since 1905. He died on Nov. 23, 1953, at the age of 91.

Born in 1862, this outstanding leader of the veterinary profession was graduated at the Alfort school in 1882, was a country practitioner for a time, and then embarked on a career of teaching and research which led to the very top of scientific as well as practical veterinary medicine. Author of many treatises, he was, perhaps, most widely known for his "History of Veterinary Medicine" which was published in 1936.

Professor Leclainche retired in 1950 and was succeeded as director of the International Office of Epizootics by Dr. Gaston Ramon.

Cows and Ingested Fetal Membrane

It has been said that a cow will eat only her own fetal membrane. Evidence to the contrary is part of the following multi-disease tale. A town resident kept his 2 Jersey cows in a small lot. One evening, 1 cow was treated for preparturient paresis. By the next morning she had calved and her uterus was everted. The fetal membrane, when removed prior to reduction of the eversion, was buried in straw in the manure pile.

The third day the second Jersey, a 2-year-old heifer, had indigestion and a diarrhea with an odd odor suggesting decomposed flesh, and the buried membrane had disappeared. She was later given a drench by the owner and on the fourth day had developed medication (aspiration) pneumonia. Thus, four distinct disease conditions in a 2-cow herd were found in four days. The eating of the other cow's membrane was not witnessed but the evidence that she had done so was strong.—W.A.A.

Two Farm Publications Merge

A journalistic change of interest to many of our readers will occur in September, when the 102-year-old *Country Gentleman*, property of the Curtis Publishing Company for 44 years, will be merged with the *Farm Journal*, owned and published by the Farm Journal, Inc., of Philadelphia since 1877. About one year ago, *Country Gentleman* changed its name to *Better Farming*. At the time of its sale, the circulation of *Country Gentleman* was 2,566,000 while that of the *Farm Journal* was 2,870,000—the two foremost journals in their field.

Radioactive Fallout by States

Summarized data, since the recent atomic tests, taken from all parts of the United States except within 200 miles of the test site in Nevada, indicate that the fallout of long-lived, radioactive constituents has been minute compared with the radioactivity normally present in the earth's crust. The bulk of the radioactivity is eliminated by decay in a matter of hours or days. Except for Idaho and Utah, it was found greatest in the middle and southern plain states west of the Mississippi.—*Science, May 13, 1955.*

New Anthrax Vaccine for Man.—A vaccine made from filtrate of anthrax cultures which contain no blood serum has been given safely to 660 volunteers. Its effectiveness is not yet known but it produced no serum sickness and can not cause infection.—*Sci. News Letter, June 4, 1955.*

To keep foot-and-mouth disease out of Australia, the personal belongings of all immigrants from Europe, who were associated with farm or farm products in the two months before embarkation, are carefully disinfected.—*Vet. Bull., April, 1955.*

CURRENT LITERATURE

ABSTRACTS

Anthrax Immunization of Sheep

Sheep were protected against anthrax by immunization with the chemically fractionated and freeze-dried culture filtrate of *Bacillus anthracis* grown in a special medium. The animals were injected intradermally with three doses of an aqueous solution of the antigen or subcutaneously with one dose of the antigen adsorbed on colloidal aluminum hydroxide. This course of immunization effectively protected them against anthrax when challenged by injections of *B. anthracis* in doses 100 to 1,000 times the lethal infective dose for the control sheep.—[*Alden K. Boor and Hugh B. Tresselt: Protection of Sheep Against Anthrax by Immunization with an Antigen Prepared in Vitro. Am. J. Vet. Res., 16, (July, 1955): 425-428.*]

Histochemical Nature of Anaplasma Marginale

This article reports the results of detailed histochemical studies of Anaplasma bodies. Blood smears were prepared from 2 cows experimentally infected with blood containing *Anaplasma marginale* and unfixed and fixed blood smears were employed in each histochemical test. The results showed positive histochemical reactions for desoxyribonucleic acid, ribonucleic acid, protein, and organic iron in the Anaplasma bodies.—[Jack E. *Moulton and John F. Christensen: The Histochemical Nature of Anaplasma Marginale. Am. J. Vet. Res., 16, (July 6, 1955): 377-380.*]

Protection of Cattle Against Leptospira

An immunogenic agent was prepared by acid-heat extraction of a soluble antigen from cultures of *Leptospira pomona* grown in Stuart's medium. Two separate lots of the material in an adjuvant composed of lanolin and mineral oil were inoculated subcutaneously each in a different group of dairy-type calves (10 to 12 weeks and 6 to 8 weeks old). Challenged parenterally with a virulent calf-passed strain of *L. pomona*, all calves receiving either one or two doses (weekly interval) of the agent were resistant to infection, whereas control calves in both trials developed leptospiremia, and leptospiruria, with pathological and clinical signs of illness. No prechallenge titers to the microscopic agglutination-lysis test were elicited in the calves inoculated with one lot of the material, whereas the second lot of material produced a slight titer response. The agent prepared as described is apparently reproducible, inexpensive, and produces immunity to at least the homologous serotype of Leptospira. In the experimental trials, it not only protected against clinical symptoms of leptospirosis but also prevented the urinary shedder state from developing.

The use of soluble antigens for immunogenic agents against other diseases is suggested.—[*Warren G. Hoag and Wilson B. Bell: An Immunogenic Agent for the Protection of Cattle Against Leptospira Pomona. Am. J. Vet. Res., 16, (July, 1955): 381-385.*]

Sampling Tube for Rumen Fluid

A tube has been devised which will allow sampling of rumen contents from different areas without admixture with material from adjacent areas.—[*R. E. Nichols: A Sampling Tube for Rumen Fluid. Am. J. Vet. Res., 16, (July, 1955): 410.*]

Effect of Desoxycorticosterone Acetate on Chicks

The subcutaneous administration of desoxycorticosterone acetate to young chicks had a profound effect on many organs. There was marked enlargement of the kidneys, hearts, testes, and livers, with atrophy of the cortical tissue but no significant change in total weight of the adrenal glands. Extensive generalized edema occurred in 79 per cent of the birds. Sixty days later, damage to the germinal epithelium of the testes was apparent but the hearts, kidneys, and adrenal glands showed marked recovery. Androgenic function of the testes, as indicated by comb growth, was slightly impaired. Posterior pituitary hormone reduced the edema caused by desoxycorticosterone acetate.—[*R. P. Link and A. V. Nalbandov: Effect of Desoxycorticosterone Acetate on Young Chicks. Am. J. Vet. Res., 16, (July, 1955): 433-436.*]

Helminth Parasites and Neoplasia

This paper is a review of helminth parasites and neoplasia, with 40 references through January, 1955. Only one causal relationship, that between larval *Taenia taeniaformis* and sarcoma in the rat, has thus far been satisfactorily established. A similar relationship is strongly suggested between *Spirocerca lupi* and esophageal sarcoma in the dog although experimental proof is lacking. The association between neoplasia and schistosomiasis seems to have some statistical basis, but the biological relationship of cause and effect remains to be established.—[*C. W. Schwabe: Helminth Parasites and Neoplasia. Am. J. Vet. Res., 16, (July, 1955): 485-488.*]

Vagal Nerve Supply to the Bovine Stomach

A technique for applying permanent intrathoracic electrodes to the dorsal and ventral vagal nerve trunks of calves is described. Spontaneous and electrically stimulated rumen motility patterns, in unanesthetized animals, were studied by simultaneous fluoroscopic and manometric methods. Spontaneous motility of the rumen of roughage-fed calves was more regular and contractions were stronger than in milk-fed calves. Response of the rumens of roughage-fed calves to vagal stimulation was more marked than that of the milk-fed calves.—[*H. E. Dzink and A. F. Sellers: Physiological Studies of the Vagal Nerve Supply to the Bovine Stomach. I. Comparison of Responses in Milk-Fed and Roughage-Fed Calves, Using a Chronic Intrathoracic Vagal Electrode Technique. Am. J. Vet. Res., 16, (July, 1955): 411-417.*]

FOREIGN ABSTRACTS

Chickens as Experimental Animals in Hyperkeratosis

Male chickens approximately 10 weeks of age were fed weekly varying doses of chemicals (chlorinated naphthalene) known to produce hyperkeratosis in cattle. The birds tolerated the chemicals. However, they demonstrated retarded growth and atrophy of combs and wattles. Pathological examination revealed hyperkeratosis of the skin, eyelids, and esophageal mucous membranes with partial epithelial metaplasia of the submucosal glands. A further characteristic abnormality was a hypogenitalism, as the testes of exposed animals were one-third to one-fourth the size of those of the controls.

Authors concluded that chemicals known to produce experimental hyperkeratosis in cattle, cats, and dogs, in addition to interference with metabolism of vitamin A, are also capable of causing endocrine disturbance expressed in hypofunction of the gonads.—[*K. Wagener and A. Krueger: Chickens as Experimental Animals in Hyperkeratosis (X Disease) (Hubner als versuchstiere by Hyperkeratose.) Deutsche Tierärztl. Wchnschr., 45-46, (1954): 457-459.*]—M. RISTIC, *Gainesville, Ga.*

Gastrointestinal Parasites of Horses

The parasites most frequently affecting horses in Uruguay are strongyles, ascarids, Habronema sp., pinworms, gastrophilus, and tapeworms. The 3 forms of strongyles present are *Strongylus vulgaris, Strongylus equinus,* and *Strongylus edentatus.* In fecal examinations on 6,436 horses, 5,860 (90%) were positive for this parasite.

Ascarid infestation is frequently heavy enough to occlude the lumen of the intestine.

The species of tapeworms most frequently found are *Anaplocephala magna* and *Anaplocephala perfoliata.* The first is larger, averaging 25 cm. in length and 2 to 3 cm. in width; the latter varies from 5 to 6 cm. in length and 1 cm. in width.

These authors reviewed the several anthelmintics available and suggested the ideal for such an agent to be one completely effective against those parasites in the stomach and intestine, without causing any harm to the health of the animal, and eliminating at least 70 per cent of the parasites.

Anthelmintics used include: phenothiazine, carbon disulfide, aspidium, arsenicals, and carbon tetrachloride. Gentian violet, which has proved effective against ascarids and Oxyuris, is of low toxicity at a dosage of 2 gr.

Laxatives used include: calomel, cascara, aloe, and castor oil.—[*E. J. Galofre: Gastrointestinal Parasites of Horses. Rev. Med. Vet. (Uruguay), 26, 1951): 1219-1236.*]—G. T. E.

Liquor "Cerebrospinalis" in the Dog

An investigation was made into the morphological, physical, and chemical properties of normal and pathological cerebrospinal fluid of dogs. The form elements occurring in each were studied, described, and named. It was considered which technique of puncture was the most useful, and an investigation was made into a staining method for the cells. All the obtained data were arranged in tables.—[*M.A.J. Verwer: Liquor Cerebrospinalis in the Dog. Tijdschr. voor Diergeneesk., Dec. 1, 1954.*]—L.V.E.

Procaine Block in Acute Mastitis

Fifty-three cases of acute bovine mastitis of undetermined etiology were treated by infiltration over the base of the affected quarter with 150 to 200 cc. of 0.25 to 0.5 per cent procaine hydrochloride. There was no other treatment except warm bandaging in cold weather and frequent milking. Fifty cases recovered clinically. No bacteriological determinations are mentioned. If the mastitis was of less than three days' duration, one treatment was sufficient. Persistent cases required re-treatment after six days. For blocking a front-quarter, the needle was inserted between the udder and the abdominal wall at the craniolateral corner, and directed toward the back of the opposite stifle. For blocking a hindquarter the needle was inserted 2 cm. from the midline at the dorsal limit of the posterior border of the gland and directed downward and forward toward the carpus on the same side. The theory of procaine block in inflammatory processes is discussed.—[*D. D. Logvinov, Kharkov Vet. Inst.: Short Novocain Block of the Nerves of the Udder in Acute Mastitis. Veterinariya, 31, (Sept., 1954): 50-52.*]—R.E.H.

The Omsk Veterinary College

In the spring of 1953, 176 graduates received their veterinary diplomas at Omsk and were assigned to positions in Siberia and the eastern

U.S.S.R. The school is composed of 26 professorial chairs, 20 laboratories, 6 clinics, 6 museums, a library with 76,000 books, and a teaching farm. The clinical departments are: pathology and therapy, general and special surgery, epizootology, obstetrics, gynecology, and artificial insemination, and parasitology. About 1,000 students are enrolled, and 52 per cent of them are women.

The experience of the departments in lecture and laboratory methods is extensively discussed in interdepartmental and college conferences and in special sessions of the academic council of the school. In the year 1952-1953, the lectures of the professors of pathological physiology and of pathology and therapy were approved and recommended as models.

Student scientific circles are organized in many of the departments. In 1952-1953, there were 19 of these groups with a total of 300 members. They completed 55 practical and experimental projects.

Discipline in the college is at a high level. Attendance is better than 98 per cent. "In the rare case of a breach of discipline, it is usual to begin with measures of an educational character — a summons to the dean's office, etc."

The technical training and the "high ideological and political level" of the students is attributed to the work of the communist party, the young communist league, and the professional association in the school. These organizations try to attract students to social work and political study.—[*A. N.: The Omsk Government Veterinary Institute. Veterinariya, 31, (Dec., 1954): 16-20.*]—R.E.H.

BOOKS AND REPORTS

Review of Medical Microbiology

This book is a presentation of the aspects of medical microbiology which are of particular significance in the fields of clinical infections and chemotherapy. The text is directed at the medical student and practicing physician with a considerable portion devoted to a discussion of basic science. A new edition will be published every two years.—[*Review of Medical Microbiology. By Ernest Jawetz, Joseph L. Melnick and Edward A. Adelberg. 360 pages. 92 figures. Paper bound. Lange Medical Publications, P.O. Box 1215, Los Altos, Calif. 1954. Price $4.50.*]—W.A.A.

Synopsis of Surgery

This work is an abridgment of the various aspects of surgical procedures which includes a definition of the ailment, the etiology, pathology, symptoms, signs, and treatment.

The first edition was published in 1908 and it is now in its fourteenth edition. The authors had in mind to give salient facts in an abstract of surgical practice. Only the main points of operation procedures and therapeutics are referred to.—[*Grovers' Synopsis of Surgery. Edited by Sir Cecil Wakeley. 603 pages. The Williams and Wilkins Company, Baltimore, 1954. Price not given.*]—WAYNE H. RISER.

Parasitic Diseases of Domestic Animals

The sixth edition of this publication, dealing with the diagnosis and control of parasitic diseases of domestic animals, has been essentially revised, and some new general sections have been added, *viz.*, historical survey, immunity, insecticides.

In the main part of this book, the diagnosis of parasitic diseases, according to the symptoms shown by the infested animals and various laboratory examinations, is discussed.

The control of the parasitic diseases and the life cycles of the parasites are discussed separately for the individual species affected.

This publication contains some good illustrations including drawings of the developmental stages of the life cycle of the parasites.

It is written clearly and is a worthwhile contribution to the important problem of parasitism and its control in domestic animals.—[*Schmid-Hieronymi: Parasitic Diseases of Domestic Animals (Die Parasitären Krankheiten der Haustiere). 29 pages. 178 illustrations. Paul Parey, Berlin-Hamburg, Germany. 1955. Price DM 28.50, approximately $7.00*]—F. KRAL.

Veterinary Hygiene

Veterinary hygiene, as an important part of preventive veterinary medicine, is discussed in this textbook. The first chapter deals with physical, chemical, and natural biological conditions as essential hygienic factors. The determination of the quality of water and the composition of soil, as well as methods of improving these factors, are discussed in further chapters. Several sections are devoted to the discussion of insufficient nutrition due to a deficiency of proteins, vitamins, and minerals as well as feeds containing toxic plants and minerals. The hygienic conditions of pastures, the hygienic construction of stables, barns, pig pens, sheep pens, dog kennels, and henhouses are further topics.

The final chapters discuss hygienic breeding and husbandry of various species of animals.

This publication is a good survey of veterinary hygiene and it may serve as an aid to students and practitioners.—[*Roots-Haupt-Hartwigk: Veterinary Hygiene (Veterinär Hygiene). 224 pages. 74 illustrations. Paul Parey, Berlin-Hamburg, Germany. 1955. Price DM 23.80, approximately $6.00.*]—F. KRAL.

Foreign Animal Diseases

This publication is a comprehensive round-up of foreign animal diseases which practicing veterinarians, public health officials, veterinary and medical school faculties, and students will find useful.

The report covers 28 diseases, including six that are transmissible to man. These diseases are established in various parts of the world. Their effects range from slight debilitation and economic loss to decimation of livestock populations.

The information on each disease includes: (1) identification; (2) symptoms; (3) pathological changes; (4) diagnosis; (5) prognosis; (6) epizootiology; (7) control; (8) public health aspects; and (9) references. This book includes charts giving the salient points of each disease, the approved diagnostic procedures, and control measures. There is also information on the methods of reporting an animal disease, for obtaining help in confirming a diagnosis, for setting up quarantines, and instigating control programs. Insect vectors and the part they play in spreading certain diseases is also dealt with.

Much of the information is based on recent personal observations which have not been published elsewhere.

With the advent of airplanes and the increased trade and travel in every part of the world today, foreign animal diseases take on a new and added importance.

In spite of rigid precautions to prevent their accidental introduction, these and other foreign diseases are a continuing threat. They could be used effectively in the event of biological warfare. —[*Foreign Animal Diseases—Their Prevention, Diagnosis and Control: Official Report of the Committee on Exotic Diseases of the United States Livestock Sanitary Association. 265 pages. Illustrated. Dr. Ralph A. Hendershott, Secretary, U.S. Livestock Sanitary Association, 1 W. State St., Trenton 8, N. J. 1954. Price: single copy $1.00; 2 to 50 copies 75 cents each; more than 50 copies 60 cents each.*]—FRANK A. TODD.

The Lung

This is a highly technical book on pulmonary physiology. It is meant primarily for the physician, physiologist, and researcher in this field.

The book is well illustrated and deals with all phases of respiratory physiology including volume data, pulmonary circulation, diffusion of gases, and the equations for the calculations of these processes.—[*The Lung, Clinical Physiology and Pulmonary Function Tests, Based on 1954 Beaumont Lecture by Julius H. Comroe, Jr., Robert E. Forster, II, Arthur B. DuBois, William A. Briscoe, and Elizabeth Carlsen. Year Book Publishers, Inc., 200 East Illinois Street, Chicago, Ill. 1955. Price* $5.50.]—WAYNE H. RISER.

Genetic Homeostasis

The word "homeostasis" was introduced by Walter B. Cannon to describe the ability of the organism to maintain a constant physiological state in the face of environmental fluctuations. In this book, Lerner has used the word in two new contexts: "developmental homeostasis," meaning constancy of phenotype despite differences in genotype and in environment, and "genetic homeostasis" to describe the tendency for a population to return to its original state after a displacement in gene frequency. In my opinion, these words add little to our understanding of the mechanisms involved, though they serve a useful descriptive purpose and have already become a part of the vocabulary of genetics. The main ideas are not new, nor does the author claim they are, but they have not previously had this much emphasis.

This is a well-written book. The thesis is succinctly stated at the outset in four pages. Then comes evidence (48 pp.) which is especially useful to the reader for Lerner has correlated a number of seemingly unrelated observations from widely diverse sources. Finally, there is a 58-page section on interpretations and applications.

Those who have read Lerner's earlier book, "Population Genetics and Animal Improvement," where the emphasis was primarily on optimum utilization of additive genetic variance, may be surprised to find a greatly different viewpoint in this one. The conclusion of most importance to the animal or plant breeder is that the best genotype may not be one that is fixable by selection, and some way of utilizing nonadditive variance may be needed for maximum productivity.

The main thesis is that heterozygosity provides a basis for both developmental and genetic homeostasis. It has often been noted that, despite frequent contrary findings where single loci are involved, individuals heterozygous for many loci usually have greater phenotypic stability than homozygotes; but whether this is due to heterozygosity per se or to greater average vigor of heterozygotes is not established. In discussing genetic homeostasis Lerner says, "Mendelian populations are also possessed of self-equilibrating properties tending to retain a genetic composition that produces a maximum average fitness in the particular environments in which these populations exist." This "self-equilibrating property" seems to me to be no more than the effect of natural selection in bringing the gene frequencies back to equilibrium after they have been changed; for example, by artificial selection. The quotation above also implies that natural selection acts in such a way as to maximize the average fitness which is not always true. Selection acts on individuals and the average fitness may or may not increase, as Wright, Fisher, and Haldane have all shown. If genetic homeostasis is simply another way of describing the action of selection, it is not very closely related to Cannon's original meaning.

These semantic reservations notwithstanding, I found the book very stimulating reading. It is certain to be widely discussed and any one interested in current thought in genetics would do well to become acquainted with it.—[*Genetic Homeostasis. By I. Michael Lerner. 134 pages. John Wiley and Sons, 440 Fourth Ave., New York 16, N. Y. Price* $3.25.]—JAMES F. CROW, *Professor of Genetics, University of Wisconsin.*

THE NEWS

Dr. C. F. Simpson, Research Fellow

Dr. Charles F. Simpson, who started his AVMA research fellowship work in the Department of Veterinary Pathology, Ohio State University, in June, 1954, was granted his M.Sc.

Dr. Charles F. Simpson

degree in June, 1955. His work included courses in: pathology technique; scientific photography; general, advanced systemic, and surgical pathology; principles of infection and resistance; and seminar in veterinary pathology.

Dr. Simpson's thesis was entitled "Bovine Cardiovascular Diseases." His research revealed that diseases of the cardiovascular system are not uncommonly found in cattle at necropsy or slaughter. A bound volume of his research thesis will be filed in the AVMA library and suitable portions of it will be published in one of the AVMA publications.

Dr. Simpson was born in New Jersey, Jan. 29, 1917, and won his B.S. degree in Agriculture at Rutgers University in 1940. He earned the D.V.M. degree at Cornell University in 1943, and then served in the Veterinary Corps of the U. S. Army for over three years, after which he was in general practice for a year. For six years before starting his fellowship work, Dr. Simpson was on the staff of the Agricultural Experiment Station, University of Florida at Gainesville.

While at the University of Florida, Dr. Simpson was author or co-author of articles on: bovine hyperkeratosis, anaplasmosis, a technique for collecting and transfusing blood in cattle, ergot poisoning, coffee weed seed poisoning of cattle, and *Haemoproteus columbae* infection in pigeons. He has returned to the University of Florida where he will resume his research.

Other Research Fellows

Dr. W. E. Ribelin (ISC '49), AVMA research fellow at the University of Wisconsin, is studying the cytopathology of vesicular stomatitis, under the direction of Dr. Carl Brandly. He is working toward a Ph.D. degree, having received his M.Sc. at Washington State College, Pullman, in 1952. Dr. Ribelin served as research veterinarian with the U.S.D.A. European Mission on Foot-and-Mouth Disease at Amsterdam, Holland, from 1952 to 1954.

Dr. Durwood Olds (OSU '43), an AVMA research fellow, is working on the physiology of reproduction at the University of Illinois, under the direction of faculty members of the Department of Dairy Science. Dr. Olds has been an associate dairy husbandman at the University of Kentucky since 1946. He is working toward a Ph.D. degree.

Dr. Charles H. Bridges (TEX '45) is working for a Ph.D. degree, at Texas A. & M. College, as an AVMA research fellow. He is studying infectious nephritis of animals in the Department of Veterinary Pathology under the direction of Dr. Hilton A. Smith. Since graduation, Dr. Bridges has served on the faculty of the Department of Veterinary Science and at the Agricultural Experiment Station of Louisiana State University, and at his alma mater.

Nine Foreign Veterinary Colleges Added to "Recognized" List

The Council on Education of the AVMA, at its semiannual meeting in Chicago on May 21-22, 1955, took action to add the following veterinary colleges to the list of foreign veterinary colleges whose graduates, for the years indicated, are recommended for consideration on the same basis as graduates of officially approved schools in the United States and Canada:

1) *Austria*
Vienna Veterinary College, Vienna (for graduates in 1950 and years subsequent thereto).

2) *Czechoslovakia*
Brno Veterinary College, Brno (for graduates prior to, and including, 1939).

3) *Estonia*
College of Veterinary Medicine, University of

Tartu, Tartu (for graduates in years prior to, and including, 1940).

4) Germany
Veterinary College, Ludwig-Maximilian University, Munich (for graduates in 1950 and years subsequent thereto).

5) Jugoslavia
Veterinary College, University of Zagreb, Zagreb (for graduates prior to, and including, 1940).

6) Latvia
College of Veterinary Medicine, University of Latvia, Riga (for graduates in years prior to, and including, 1944).

7) Lithuania
Veterinary Academy of Kaunas, Kaunas (for graduates during years 1936 to 1944, inclusive).

8) Poland
Veterinary College, Lemberg (Lwow) (for graduates prior to, and including, 1944).

9) Republic of the Philippines
College of Veterinary Medicine, University of the Philippines, Manila (for graduates in 1953 and years subsequent thereto).

For an explanatory statement and the balance of the foreign schools similarly classified, *see* the JOURNAL (Sept., 1954: 256).

American Association of Veterinary Nutritionists

There are many veterinarians who devote their major activities to the nutrition field. Some are associated with educational institutions doing research. Some are employed by feed companies as consultants, on a fulltime or part-time basis. Others work for suppliers to the feed industry, such as manufacturers of vitamin and mineral products used for the fortification of feed.

As a result of a series of recent meetings, an organization of these veterinarians is now being formed. The need for such a group was agreed upon, the primary reasons being:

1) Recognition of nutrition as a specialty in our profession.

2) Organization of our thinking on subjects of mutual interest with the feed industry.

3) Giving guidance, based on our collective thinking, on problems such as "medication of feed," to serve the best interests of the livestock industry in which both the feed industry and the veterinary profession are interested.

In November, 1954, the AVMA Committee on Nutrition appointed a subcommittee to implement the organization of the American Association of Veterinary Nutritionists. This group will meet Monday, August 15, at 4:30 p.m. in the Spanish Room of the Radisson Hotel. Any veterinarian interested in nutrition —research or commercial—is invited to attend.

Please direct comments, suggestions, and names of veterinarians who might be interested to any of the following three members of the subcommittee: W. D. Pounden, Ohio State Agricultural Experiment Station, Wooster, Ohio; R. E. Lubbehusen, Purina Mills, 835 S. 8th St., St. Louis, Mo.; M. Erdheim, chairman, Dawe's Laboratories, Inc., 4800 S. Richmond St., Chicago 32, Ill.

STUDENT CHAPTER ACTIVITIES

For copy deadline, see "Among the States and Provinces"

Georgia Chapter.—At the February 28 meeting of the University of Georgia Student Chapter of the AVMA, **Lt. Col. B. F. Trum** of Oak Ridge, Tenn., was the guest speaker. There were 132 members in attendance at this meeting.

At a special meeting on March 23, with 162 members in attendance, **Dr. A. H. Quin,** president of the AVMA, gave a brief history of the veterinary profession and a glimpse of the future. A panel, on treatment of diseases of horses and sheep was composed of **Drs. T. S. Maddox,** Greenville, Ky., and **C. W. Parker,** Charlotte, N. Car., with **Dr. A. M. Mills,** University of Georgia, as moderator.

At another special meeting on April 7, the **Honorable Phil Campbell,** commissioner of agriculture of Georgia, spoke on the relationship of the economy land development of agriculture to veterinary medicine.

The 151 members in attendance at the April 11 meeting, heard **Dr. Edward Jordan,** Auburn, Ala., discuss classes and breeds of dogs.

Dr. G. E. Hawley, Terre Haute, Ind., addressed the group of 167 members at the April 25 meeting. **Dr. Virgil Robinson,** Pitman Moore Co., Indianapolis, Ind., was the speaker at the May 9 meeting (205 members).

The following officers were elected at the business session: Frank Craig, president; William J. Benton, president-elect; Henry A. Virts, vice-president; Deadrich Beusse, recording secretary; Glenn Noffsinger, treasurer; Russel Linsey, corresponding secretary; and John Roeder, Ag hill representative.

Social activities included the annual picnic on April 20 and dean's night on May 23, at which the awards were presented to student and faculty members. The dean's cup, which is presented to the outstanding senior, was awarded to Theodore Yerasimides. There were 250 at the picnic and 195 members at dean's night.

S/BAYNE E. MILLER, *Retiring Secretary.*

• • •

Illinois Chapter.—At the annual spring banquet of the University of Illinois Student Chap-

ter of the AVMA, **Dean L. B. Howard,** of the Department of Agriculture, spoke on the development of agriculture through research.

s/VINCENT W. CHAFFEE, *Secretary.*

• • •

Michigan Chapter.—At the annual honors convocation of the Michigan State University on March 23, Ronald Waldby was awarded the Borden Award for outstanding scholarship during the first three years of his veterinary course.

The new officers of the Chapter are: Ernie Liptak, president; Bob Russell, president-elect; Woody Asberg, vice-president; Aaron Leash, treasurer; Ellin Abbott, secretary; and Al Fields, sergeant-at-arms.

The following speakers addressed the various meetings of the Chapter: **Drs. William Magrane,** Mishawaka, Ind.; **G. Stocking,** Camp Carson, Colo.; **Harold Decker,** Indianapolis, Ind.; and **Harry Kingman, Jr.,** assistant executive secretary of the AVMA.

Both students and faculty members enjoyed the annual picnic held May 24.

s/ELLIN ABBOTT, *Secretary.*

• • •

Oklahoma Chapter.—The major social events of the Oklahoma A. & M. College Student Chapter of the AVMA for the school year were a social evening for alumni attending the homecoming game, a Christmas party, a picnic held early in April, and a dinner dance on May 28.

The following officers will serve for the fall term of the 1955-1956 school year: J. B. Roberts, president-elect; Leon Self, treasurer; Robert L. Godby, secretary; James Ferneau, student representative to the annual AVMA convention; Betty Benton, assistant editor; and the following class representatives: Louis Heavner (freshman), William Askew (sophomore), and James O. Harrod (junior).

Awards presented at the year's end included the award of the Women's Auxiliary to the AVMA to the outstanding senior, Dan E. Goodwin; and the Dean McElroy Award to Bob Hudson.

s/ROBERT L. GODBY, *Secretary.*

WOMEN'S AUXILIARY

Michigan Student Auxiliary.—The wives did it again—completed another very successful year of social and educational events. During this past year, the Women's Auxiliary to the Michigan State College Student Chapter of the AVMA enjoyed many social activities and projects, such as bake sales, a bohemian dinner, a faculty tea, and others. The social meetings are held once a month during the school year.

The club advisors were Mrs. C. F. Clark, Mrs. Raymond Johnston, and Mrs. Donald McWade, wives of faculty members in the School of Veterinary Medicine at M.S.C.

Two other evenings a month, we went to classes to learn how to be a top-notch "Mrs. Veterinarian," under the expert guidance of Dr. Chester F. Clark, dean of the School of Veterinary Medicine, Drs. Andrew Wheeler, and Alfred Scholls. The course is designed to give the wives some scientific fundamentals of veterinary medicine, and also to point out the right path to travel in becoming helpmates to their husbands.

The course offered the group of over 100 wives lectures concerning sterilization of equipment, bookkeeping, pharmaceutical aspects of veterinary medicine, how to go about looking for a location in which to start a practice, radiology, recognizing breeds of dogs, and a lecture on cancer. The senior wives learned about laboratory techniques, including how to do blood counts and urine analysis.

When the senior wives leave M.S.C. with their husbands, they also take along a "degree" —"PHT" (Pushing Hubby Through), which is presented by Dr. C. F. Clark at the annual senior tea which the junior wives sponsor (see July, JOURNAL, p. 85).

This year at the senior tea or "graduation," held May 16, each senior wife received a corsage, and wore a black graduation cap with gray tassel. The Theme of the graduation was "on graduation day," and the motto was "your first, M.S.C.'s 100th." A humorous touch was provided by an informal enactment of the "class prophecy."

During the program, Mrs. Patricia Adams, graduating president of the club, received an award from the Men's Council of Veterinary Medicine at M.S.C. for the outstanding wife of the year.

s/MRS. RALPH HASSE, *Publicity Chairman.*

• • •

Oregon Auxiliary.—The spring meeting of the Women's Auxiliary to the Oregon State Veterinary Medical Association was held April 30, 1955, in Klamath Falls, with President Mrs. Austin Eivers presiding.

Mrs. E. R. Derflinger of Salem was introduced as the delegate, and Mrs. O. H. Muth of Corvallis as alternate, to the national convention to be held in Minneapolis this summer.

Mrs. Edward Holden reported on the plans for the Tri-State Convention to be held July 25-27 in Portland, and announced committee appointments.

Correspondence expressing gratitude for donations were received from the AVMA Research Fund and the AVMA Scholarship Fund.

Mrs. Harry Leanord was chairman of the committee making arrangements for the wonderful spring meeting. Others on the committee were: Mrs. Joe Riker, Mrs. Harley McFadden, Mrs. Earl Harris, Mrs. J. C. Hunt, Mrs. Clarence Gansberg, Mrs. Fred Wedam, and Mrs. John Schmidt.

s/MRS. DENNIS DEJONG, *Secretary.*

• • •

Women's Auxiliary Announces Recipients of 1955 Achievement Awards.—This is the sixth year that the Women's Auxiliary to the AVMA has presented $25 and a certificate of achievement to the outstanding student in the senior class of each of the schools of veterinary medicine in the United States and Canada.

These award winners have records that show superior scholarship, accomplishments in extracurricular activities, and abilities for leadership; they possess those qualities so necessary for success in their chosen profession. The selection is made by the deans and faculty and/or the respective student chapters.

Our Auxiliary tries to instill in the veterinary student a desire to promote good will and understanding between veterinary medical students and the other students on the campus.

The 1955 award winners are identified in the composite picture. Space does not permit including the records upon which the selections were made.

s/(MRS. LEWIS H.) MARGUERITE MOE,
Second Vice-President.

Left to right:

Robert P. Houk,
Alabama Polytechnic Institute.
William B. Wetmore,
University of California.
John A. Recht,
Colorado A. & M. College.

• • •

James P. Childress,
Cornell University.
Donald T. Barnes,
University of Georgia.
John D. Clayton,
University of Illinois.
Wayne W. Brown,
Iowa State College.

• • •

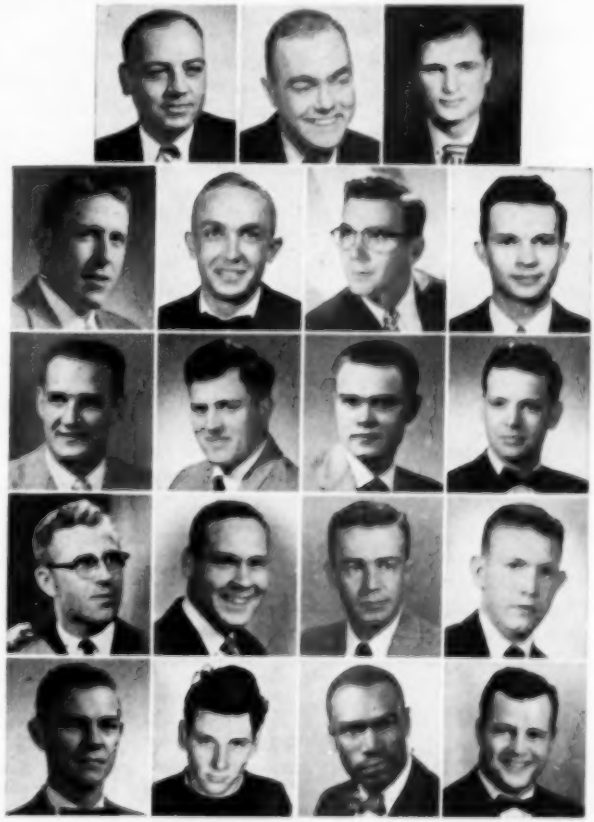
Hiram H. Faubion,
Kansas State College.
Robert D. Duryea,
Michigan State University.
Dean F. Johnson,
University of Minnesota.
Clyde L. Chandler,
University of Missouri.

• • •

Jean B. Phaneuf,
University of Montreal.
Arthur Freeman,
Ohio State University.
Dan E. Goodwin,
Oklahoma A. & M. College.
James F. Mock,
University of Pennsylvania.

• • •

Edgar R. Willmann,
Texas A. & M. College.
Torgny N. Fredrickson,
University of Toronto.
Ptolemy A. Reid,
Tuskegee Institute.
James T. Dowe,
State College of Washington.



News From Washington

Public Law 118, signed by the President on June 30, 1955, **extends the regular draft for two years and continues the special pay for medical, dental, and veterinary officers for four years.** One of the several amendments to the Universal Military Training and Service Act contained in PL-118 reduces the age liability for service under the doctor draft to 46; therefore, no doctor will be liable for service under the doctor draft provisions of the Act after attaining his 46th birthday. Another exempts any doctor over 35 who at any time applied for a commission and was rejected on the sole basis of physical disqualification.

Prior to final passage of the draft and special pay bills, certain differences between the Senate and House versions were ironed out in conference. Among these was the Senate amendment providing that veterinarians employed by the U.S.D.A. would not be subject to induction under the regular draft except in time of war or national emergency (see JOURNAL, July, 1955: 84). The House managers objected to this amendment as members of the uniformed services. The Senate managers receded from their insistence on adoption of this amendment to the U.M.T. Act.

★ ★ ★

The **increase in pay recently voted by Congress for all federal civil employees** necessitated an adjustment in the minimum pay for professional veterinary positions at grade GS-7 (see JOURNAL, July, 1955: 84). The new rate will be $4,930. The minimum pay for GS-9, to which grade a veterinarian is automatically promoted after six months of satisfactory service, is now $5,440.

★ ★ ★

The House Ways and Means Committee announced unexpectedly on June 17 that hearings would be held June 27 and 28 on HR-9 and HR-10 (Jenkins-Keogh). **These bills,** cited as the "Individual Retirement Act of 1955," **would encourage the self-employed person to establish voluntary pension plans by providing for tax deferment on funds paid into a retirement fund.** A representative of the AVMA testified before the Committee on June 28, that the AVMA had been on record for several years favoring legislation of the type proposed and had supported similar legislation in 1953. It was pointed out that the Congress had helped corporations establish approved pension plans for employees, including executives thereof, by granting tax benefits; that enactment of HR-9 and 10 would remove an inequity in the tax law that now penalized the self-employed person desiring to provide for his family and himself. The Committee was urged to consider favorably the enactment of the legislation.

★ ★ ★

The Committee on Ways and Means, in another surprise move, announced in the **Congressional Record** on July 6 that it **would approve certain amendments to the Social Security laws.** Among these are: continue benefit payments to disabled children aged 18 and over; reduce the eligibility age for women from 65 to 62 years; provide disability benefits for insured workers at age 50; **extend compulsory coverage to** (among others) **veterinarians; revise the contribution schedule to maintain the actuarial soundness of the old age and survivors' program.** (Note: Although the House acted favorably at this session on any bill amending the Social Security Act, which the Committee reported, it is **most unlikely** the Senate Finance Committee will take any action during this session of the Congress.)

AVMA Office Address in Washington
Brig. General James A. McCallam (Ret.)
Room 109, 1507 M Street, N.W.
Washington 5, D. C.

COMMENCEMENTS

Alabama Polytechnic Institute.—At the 1955 commencement exercises of the School of Veterinary Medicine, Alabama Polytechnic Institute, the following 66 candidates were presented for the D.V.M. degree:

Abram G. Allen, Jr.
David M. Bedell
Wallace E. Birch
William J. Brooks
Kermit R. Burdette
Van T. Burnette
William L. Carter
Claude C. Casey, Jr.
Curtis C. Christenberry
Robert N. Cole
Robert L. Conrad
Edwin C. Darty
Harry Flotemersch
Paul H. Freeman
Richard B. French
Vola Gardner
Theodore R. Geci
Leonard P. Griffin
Johnny K. Griggs
Robert P. Houk
Thomas J. Howard
John L. Jernigan
Robert G. Jordan
Charles L. Justo
Roy F. Kinard
Stanley F. Lacey
Donald G. Lawson
Alfred J. Liepold
Elliott H. Martin
Steele F. Mattingly
Julian W. Maupin
Robert G. McCrory
Jack H. McElyea
Douglas C. McKee
Homer C. Moody, Jr.
Wellington Moore, Jr.
Horace C. Morgan, Jr.
Louis R. Nelson
Austin C. Newman, Jr.
Jack L. Nunnery
William C. Patterson
John K. Pearce, Jr.
Frank H. Platt
Joseph C. Powers, Jr.
Cassie W. Price
William T. Pumpelly
John R. Ray
William S. Rogers
Mitchell S. Rohleder
Bernard C. Schuster
Richard H. Seabrooks
J. C. Shanklin
Finous H. Smith
Thomas N. Snider
Daniel M. Thomas
John T. Vaughan
William A. Veach
Willie F. Wager
William E. Walker
Hugh G. Ward
Sam F. Ward
Daryle E. Whitfield
Joe T. Williams
Thomas L. Winkler
William E. Wise
Clarke S. Yarbrough

Graduating Class, 1955, School of Veterinary Medicine, Alabama Polytechnic Institute

Front row (left to right)—John T. Vaughan, Joseph C. Powers, Jr., Douglas C. McKee, Richard H. Seabrooks, Van T. Burnette, Alfred J. Liepold, Wellington Moore, Jr., William S. Rogers, David M. Bedell, Vola Gardner, Horace C. Morgan, Jr.

Second row—Clarke S. Yarbrough, Cassie W. Price, Richard B. French, Homer C. Moody, Jr., William L. Carter, William T. Pumpelly, Curtis C. Christenberry, Paul H. Freeman, William C. Patterson, John R. Ray.

Third row—Mitchell S. Rohleder, Robert G. McCrory, Thomas N. Snider, Edwin C. Darty, Hugh G. Ward, Kermit R. Burdette.

Fourth row—Austin C. Newman, Jr., Robert L. Conrad, John L. Jernigan, Robert N. Cole, Steele F. Mattingly.

Fifth row—Charles L. Justo, Sam F. Ward, Robert G. Jordan, Louis R. Nelson, Thomas L. Winkler, Robert P. Houk.

Sixth row—Finous H. Smith, Jack H. McElyea, Theodore R. Geci, Harry Flotemersch, Julian W. Maupin John K. Pearce, Jr., Abram G. Allen, Jr.

Seventh row—Bernard C. Schuster, Stanley F. Lacey, William E. Wise, William J. Brooks, Daniel M. Thomas.

Eighth row—Willie F. Wager, J. C. Shanklin, Johnny K. Griggs, Leonard P. Griffin, Thomas J. Howard, Daryle E. Whitfield, Joe T. Williams.

Ninth row—Roy F. Kinard, Donald G. Lawson, Jack L. Nunnery, Frank H. Platt, Elliott H. Martin, William E. Walker, William A. Veach, Wallace E. Birch, Claude C. Casey, Jr.

University of California.—At the 1955 commencement exercises of the School of Veterinary Medicine, University of California, the following 49 candidates were presented for the D.V.M. degree:

William R. Bayliss
Lawrence J. Berry
Raymond M. Bloom
Howard E. Bond
Robert M. Bramman
Ralph R. Buon-Cristiani
Homer T. Caston
Griffith T. Clark
Denny G. Constantine
Ray R. Crookshanks
Jack A. Darling
Russell E. Douthit
John M. Eriksson
Jack Faivus
Frederick S. Foote
Ted G. Garten
Henry C. Gregg
Keith L. Haydon
Joe R. Held
John T. Hollister
Arlen F. Kantor
Alex J. Kniazeff
Robert M. Lee
Valentine J. Marasco
Donald E. Martinelli
Roy E. Mountain
James T. Murphy
Robert H. Nagle
Charles B. Nelson
Harry Oja
Robert D. Olsen
Olin Paul
Milburn W. Reed
Edward L. Roberts
Renout Roland-Holst
William E. Rushworth
Mervyn B. Shenson
Edward M. Smith
Ralph A. Smith
Thomas N. Snortum
Gordon H. Theilen
Douglas J. Vance
William B. Wetmore
John Wheaton
Robert W. Wichmann
Jackson D. Wood
Robert L. Woolf
Ben York, Jr.
John Young

Graduating Class, 1955, School of Veterinary Medicine, University of California

Top row (left to right)—William R. Bayliss, Lawrence J. Berry, Raymond M. Bloom, Howard E. Bond, Dean D. E. Jasper, Robert M. Bramman, Ralph R. Buon-Christiani, Homer T. Caston, Griffith T. Clark.

Second row—Denny G. Constantine, Ray R. Crookshanks, Jack A. Darling, Russell E. Douthit, John M. Eriksson, Jack Faivus, Frederick S. Foote, Ted G. Garten.

Third row—Henry C. Gregg, Keith L. Haydon, Joe R. Held, John T. Hollister, Arlen F. Kantor, Alex J. Kniazeff, Robert M. Lee, Valentine J. Marasco.

Fourth row—Donald E. Martinelli, Roy E. Mountain, James T. Murphy, Robert H. Nagle, Charles B. Nelson, Harry Oja, Robert D. Olsen, Olin Paul.

Fifth row—Milburn W. Reed, Edward L. Roberts, Reynout Roland-Holst, William E. Rushworth, Mervyn B. Shenson, Edward M. Smith, Ralph A. Smith, Thomas N. Snortum.

Bottom row—Gordon H. Theilen, Douglas J. Vance, William B. Wetmore, John Wheaton, Robert W. Wichmann, Jackson D. Wood, Robert L. Woolf, Ben York, Jr., John Young.

Colorado A. & M. College.—At the 1955 commencement exercises of the School of Veterinary Medicine, Colorado A. & M. College, the following 59 candidates were presented for the D.V.M. degree:

David H. Asay
Robert E. Bartlett
Robert L. Benedict
Earl J. Berens
Lewis S. Bergstrom
Marvin L. Biggs
Bruce W. Blackburn
Robert E. Bryant
John M. Cameron
George F. Chandler
Loran J. Clark
Keith Cornforth
James E. Costello
Robert O. Dull
Ivan R. Edwards
Leroy P. Fay
Wayne G. Fluke
Arthur L. Gilger
Thomas C. Gray
David D. Herrick
James M. Hitch
Charles L. Huffman
James J. Hurry
Brian L. Hutcherson
Lee P. Johnson
Charles A. Johnstone
Donald T. Kerr
Elliott R. Killpack
Warren L. Kirkley
Donald L. Kreycik
James W. Langley
Jack E. Lester
Stuart A. Lovelace
James A. Lowe
Kenneth Masterson
Douglas W. Melcher
Mrs. Robert Packard
Robert H. Packard
McKinley Phelps
John A. Recht
Fred J. Roberts
Van D. Sandstedt
John C. Sawyer
William A. Scott
S. Ruth Sera
Bernard J. Smith
Gordon C. Solomon
Robert M. Teegarden
William C. Tobin
Roger E. Tunnicliff
James A. Urich
Bruce W. Walker
Lory T. Walker
Theodore Weinmeister
James L. White
Robert W. Whitford
Donald H. Will
Leslie P. Williams
Bertram O. Woodworth

Graduating Class, 1955, School of Veterinary Medicine, Colorado A. & M. College

Top row (left to right)—Robert L. Benedict, Bertram O. Woodworth, Bruce W. Blackburn, Robert M. Teegarden, Douglas W. Melcher, Charles L. Huffman.

Second row—Donald H. Will, James J. Hurry, William A. Scott, James L. White, Robert E. Bartlett, Roger E. Tunnicliff, Warren L. Kirkley, Robert O. Dull.

Third row—David D. Herrick, Loran J. Clark, Lee P. Johnson, Bruce W. Walker, Mrs. Robert Packard, S. Ruth Sera, Iran R. Edwards, Jmes M. Hitch, Marvin L. Biggs, James W. Langley.

Fourth row—Jack E. Lester, Robert H. Packard, Lory T. Walker, Thomas C. Gray, Keith Cornforth, Lewis S. Bergstrom, Charles A. Johnstone, David H. Asay, John C. Sawyer, Kenneth Masterson, Leslie P. Williams.

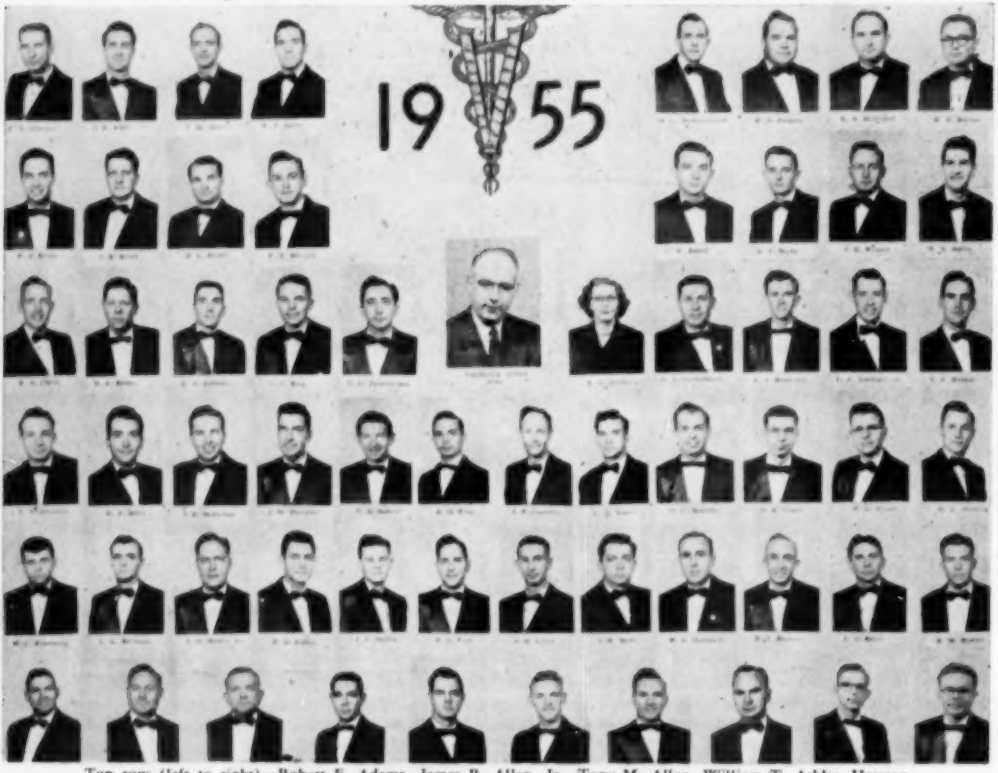
Fifth row—Robert E. Bryant, William C. Tobin, Bernard J. Smith, Fred J. Roberts, Theodore Weinmeister, James A. Urich, Wayne G. Fluke, James A. Lowe, Arthur L. Gilger, Gordon C. Solomon, Earl J. Berens, Van D. Sandstedt.

Bottom row—Stuart A. Lovelace, Elliott R. Killpack, Robert W. Whitford, James E. Costello, George F. Chandler, McKinley Phelps, Leroy P. Fay, John A. Recht, John M. Cameron, Donald T. Kerr, Brian L. Hutcherson, Donald L. Kreycik.

University of Georgia.—At the 1955 commencement exercises of the School of Veterinary Medicine, University of Georgia, the following 59 candidates were presented for the D.V.M. degree:

Robert E. Adams
James R. Allen, Jr.
Tony M. Allen
William T. Ashby
Ralph E. Ayers
Donald T. Barnes
Edward S. Batts
Charles W. Beard
Thomas F. Benson
Norman E. Bowen
Roswell S. Bowersett
David L. Brown, Jr.
Joseph E. Brown
Pete J. Brown
James M. Butler, Jr.
John A. Chandler
William E. Clarke
David A. Crane
Joseph E. Currie, Jr.
Patrick D. Ellison
Frederick F. Everhart, Jr.
Marvin L. Fleming
Donald C. Ford
Elton J. Gissendanner
Theodore N. Gounaris, Jr.
James E. Harris
Wayland F. Hogan, Jr.
Willis B. Hollingsworth, Jr.
Dallas E. Hudson
James W. Hutto
Leroy E. Johnson
Helen E. Jordan
Calvin L. Ketner
Charles C. King, Jr.
J. Donald Lynch
James E. McClellan
Earl A. McDowell
Carl D. McElveen
Frank E. Mitchell
Howard S. Nash
George C. Neserke
Eugene F. Nicks
William D. Paulette
Charles E. Polk
Eldon D. Risher, Jr.
Laurie E. Roach
Roger G. Roop
Myron C. Rosenberg
Richard M. Shiflett
Walton A. Smith, Jr.
William R. Sorrell
Walker S. Thompson
James M. Thornton
Charles H. Wade
Luther L. Wertman
Jack E. Wesson
Herman L. Westmoreland
William B. Williams
Theodore G. Yerasimides

Graduating Class, 1955, School of Veterinary Medicine, University of Georgia



Top row (left to right)—Robert E. Adams, James R. Allen, Jr., Tony M. Allen, William T. Ashby, Herman L. Westmoreland, William D. Paulette, Earl A. McDowell, William R. Sorrell.

Second row—Pete J. Brown, Joseph E. Brown, David L. Brown, Jr., Frank E. Mitchell, Charles W. Beard, Eugene F. Nicks, Jack E. Wesson, Ralph E. Ayers.

Third row—William E. Clarke, Norman E. Bowen, Leroy E. Johnson, Charles C. King, Jr., Theodore G. Yerasimides, Dean Thomas J. Jones, Helen E. Jordan, Elton J. Gissendanner, Roswell S. Bowersett, Frederick F. Everhart, Jr., Thomas F. Benson.

Fourth row—Theodore N. Gounaris, Jr., Walton A. Smith, Jr., James E. McClellan, James M. Thornton, Dallas E. Hudson, Roger G. Roop, John A. Chandler, Laurie E. Roach, George C. Neserke, David A. Crane, Patrick D. Ellison, Marvin L. Fleming.

Fifth row—Myron C. Rosenberg, Luther L. Wertman, James M. Butler, Jr., Eldon D. Risher, Jr., James E. Harris, Donald C. Ford, J. Donald Lynch, James W. Hutto, Walker S. Thompson, Donald T. Barnes, Edward S. Batts, Richard M. Shiflett.

Bottom row—Charles H. Wade, William B. Williams, Howard S. Nash, Clyde W. Taff, Charles E. Polk, Willis B. Hollingsworth, Jr., Calvin L. Ketner, Carl D. McElveen, Joseph E. Currie, Jr., W. F. Hogan, Jr.

University of Illinois.—At the 1955 commencement exercises of the School of Veterinary Medicine, University of Illinois, the following 31 candidates were presented for the D.V.M. degree:

James W. Allison
Wallace E. Brandt
John D. Clayton
Daniel Cohen
Thomas M. Drije
Charles A. Esser
Carl F. Ferrell, Jr.
James H. Finnell
James E. Fitzgerald
Frederick E. Fricke
Lloyd C. Helper
Ralph O. Holstein
Darrell L. Jensen
Paul E. Johnson
Norman D. Jones
Charles M. Josephson
Robert J. Keough
J. D. Kerr
James S. Larsen
Dragutin Maksic
Donald V. Osborne
Thomas N. Phillips
Mrs. Dorothy S. Safanie
Harvey D. Schneider
Walter G. Schwalbe
George H. Sheets, Jr.
John A. Shiels
Russell D. Smith
Theodore L. Wagy
Alexander J. Winter
Ralph F. Ziegler

Graduating Class, 1955, College of Veterinary Medicine, University of Illinois

Iowa State College.—At the 1955 commencement exercises of the Division of Veterinary Medicine, Iowa State College, the following 57 candidates were presented for the D.V.M. degree:

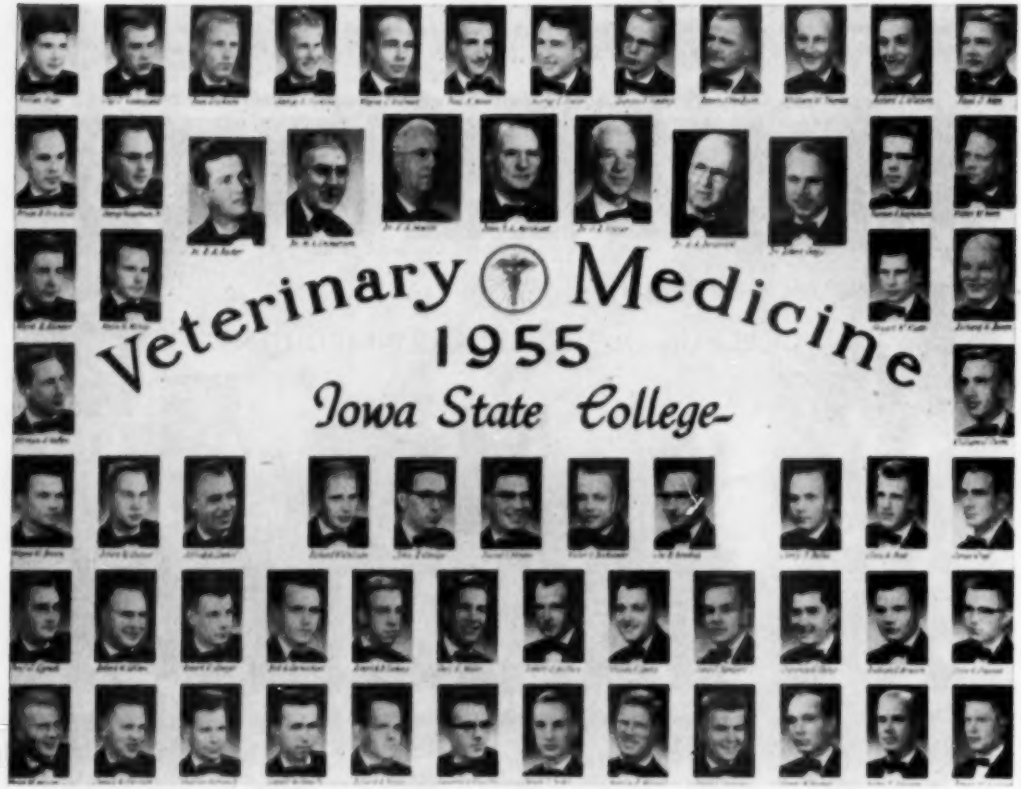
Rudolph E. Arneson
Richard H. Baum
Jerry P. Belha
Wayne W. Brown
Dick A. Carmichael
Clarence H. Ching
Richard W. Collison
John R. Conley
Robert C. Cowger
John E. Crawley
James Creel
Walter E. Dockstader
Joe B. Doudna
Dean Erickson
George S. Firkins
Michael Foley
Murray E. Fowler
Bruce B. Gradous
Robert K. Gubser
Norman E. Hafen
George Hausman, Jr.
Wayne C. Hillman
Frank N. Hughes
Charles Hymas, Jr.
James K. Johnson
Keith T. Johnson
Jerald E. Jorgensen
Robert W. Keirs
Gary J. Kempers
Jay C. Kleuveland
Robert H. LeVan
Alfred A. Loehrl
William E. Lowry
Paul J. Lynch
Robert C. McClure
Eugene H. McGehee, Jr.
Nevin H. McKay, Jr.
Carl E. Miller
Marvin H. Mitchell
Richard A. Moody
Paul N. Moser
Paul O. Nees
Owen W. Nelson
William J. Owen

(Continued on page 170)

(Iowa—Continued from page 169)

John H. Post
Ward R. Richter
Thomas A. Stephenson
Duane I. Strom
Quenten D. Sundberg
William W. Thomas
Robert J. Van Ryzin
Walter W. Van Steenbergen
Shuart W. Waldo
Robert L. Watson
Augustus H. Wharton
James T. Yoder
Roderick D. Zachary

Graduating Class, 1955, School of Veterinary Medicine, Iowa State College



Top row (left to right)—Michael Foley, Jay C. Kleaveland, Dean Erickson, George S. Firkins, Wayne C. Hillman, Paul N. Moser, Murray E. Fowler, Quenten D. Sundberg, Robert J. Van Ryzin, William W. Thomas, Robert L. Watson, Paul O. Nees.

Second row—Bruce B. Gradous, George Hausman, Jr., Dr. R. A. Packer, Dr. M. A. Emmerson, Dr. E. A. Hewitt, Dean I. A. Merchant, Dr. G. R. Fowler, Dr. E. A. Benbrook, Dr. Robert Getty, Thomas A. Stephenson, Walter W. Van Steenbergen.

Third row—Ward R. Richter, Nevin H. McKay, Jr., Shuart W. Waldo, Richard H. Baum.

Fourth row—Norman E. Hafen, William J. Owen.

Fifth row—Wayne W. Brown, Robert K. Gubser, Alfred A. Loehrl, Richard W. Collison, John R. Conley, Duane I. Strom, Walter E. Dockstader, Joe B. Doudna, Jerry P. Belha, John H. Post, James Creel.

Sixth row—Paul J. Lynch, Robert H. LeVan, Robert C. Cowger, Dick A. Carmichael, Roderick D. Zachary, Carl E. Miller, Robert C. McClure, William E. Lowry, Gary J. Kempers, Clarence H. Ching, Rudolph E. Arneson, John E. Crawley.

Bottom row—Owen W. Nelson, James K. Johnson, Charles Hymas, Jr., Eugene H. McGehee, Jr., Richard A. Moody, Augustus H. Wharton, James T. Yoder, Marvin H. Mitchell, Jerald E. Jorgensen, Frank N. Hughes, Keith T. Johnson, Robert W. Keirs.

Kansas State College.—At the 1955 commencement exercises of the School of Veterinary Medicine, Kansas State College, the following 57 candidates were presented for the D.V.M. degree:

Edward S. Ackerman
John A. Allen
Winfred A. Andrews
Harry J. Baker
Larry D. Barbee
George H. Barney
William J. Bracken
Clair E. Butler
Bobby L. Caraway
Douglas L. Church
Dale W. Claybaker
Steward W. Cole, Jr.

Raymond O. Cooper
Donald F. Cox
Byron E. Denholm
Barry C. Emerson
Hiram H. Faubion
Robert H. Featherston
James W. Feeter
John R. Ferguson
Richard W. Fish
Walter T. Gier
Dale C. Gigstad
John W. Gordon
Donald F. Hodgson
Richard E. Hudson
Marcus R. Humphrey
Harold E. Jenkins
George E. King
Ross A. Kuttler
Martin D. Kvitle
Earl R. Leslie
Charles O. McCullough
Norman R. Meriweather
Robert B. Miller
Robert L. Novak
Charles L. Olson
Howard D. Opheim
Richard L. Parker
Leo F. Paulich
Dudley D. Pautz
James K. Payne
Melvin U. Pettit
Thomas D. Pollard
Eugene L. Rizek
Richard M. Sambol
Ridge L. Scott
Maurice L. Shires
James T. Simper
Danforth D. Taylor
Ellsworth E. Thebert
Robert V. Tuma
Rollin W. Vickery
Donald L. Waddell
Richard L. Wampler
Carroll K. Weich
Meredith J. Wildfong

Graduating Class, 1955, School of Veterinary Medicine, Kansas State College

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Michigan State University.—At the 1955 commencement exercises of the School of Veterinary Medicine, Michigan State University, the following 63 candidates were presented for the D.V.M. degree:

Steven G. Abrams
William C. Adams
James H. Anderson
Charles R. Baker
Christian E. W. Baker
Robert E. Becker
Frank B. Bolenbaugh
Stanley J. Bower
Don E. Britten
Fred J. Brockett, Jr.
Richard L. Brutus
William F. Casler
John H. Clark
Albert R. Danos
Maurice G. DeLaney
John W. Dillehay
Clyde J. Douglass
Nicholas Dudynsky
Robert D. Duryea
Gerald A. Eddy
Franklin G. Emerson
Fred E. Endres
Ernest F. Engel
Doris B. Erickson
Mitchell Essey
Richard L. Evinger
Gordon K. Fay
Loren E. Gambrel
Robert W. Gordon
Elmer E. Graber
Arnold F. Hentschl
Robert C. Hervey
L. Bruce Horrall
John C. Jefferies
Carl J. Johnson
Donald R. Karr
Kenneth E. Kolka
Dennis J. Kovan
Calvin A. Larsen
William M. Lynch

(Continued on page 172)

(Michigan—Continued from page 171)

Jack H. McClure
James A. McCormack
Ernest W. Miller
Elliott M. Myers
John W. Nara
Carl F. Nash
John D. Palarski
Richard L. Palmer
Kenneth C. Perry
Gerald H. Reed
Charles W. Renshaw
William D. Segula
Joseph L. Sewell
Wayne E. Stockton
Stanley B. Thorne
Kenneth V. Tost
William E. VanLue
Gerald F. VerMeulen
Ronald W. Waldby
Allan L. Wasserman
Marion K. Weberlein
Francis D. Wreggelsworth
Walter F. Zander

Graduating Class, 1955, School of Veterinary Medicine, Michigan State University

Top row (left to right)—Steven G. Abrams, William C. Adams, James H. Anderson, Charles R. Baker, Christian E. W. Baker, Robert E. Becker, Frank B. Bolenbaugh, Stanley J. Bower, Don E. Britten, Fred J. Brockett, Jr., Richard L. Brutus, William F. Casler, John H. Clark.

Second row—Albert R. Danes, Maurice G. DeLaney, John W. Dillehay, Clyde J. Douglass, Nicholas Dudynsky, Robert D. Duryea.

Third row—Gerald A. Eddy, Franklin G. Emerson, Fred E. Endres, Ernest F. Engel, Doris B. Erickson, Mitchell Essey, Richard L. Evinger, Gordon K. Fay.

Fourth row—Loren E. Gambrel, Robert W. Gordon, Elmer R. Graber, Arnold F. Hentschl, Robert C. Hervey, Dean C. F. Clark, L. Bruce Horrall, John C. Jefferies, Carl J. Johnson, Donald R. Karr, Kenneth E. Kolka.

Fifth row—Dennis J. Kovac, Calvin A. Larsen, William M. Lynch, Jack H. McClure, James A. McCormack, Ernest W. Miller, Elliott M. Myers, John W. Nara, Carl F. Nash, John D. Palarski, Richard L. Palmer, Kenneth C. Perry, Gerald H. Reed.

Bottom row—Charles W. Renshaw, William D. Segula, Joseph L. Sewell, Wayne E. Stockton, Stanley B. Thorne, Kenneth V. Tost, William E. VanLue, Gerald F. VerMeulen, Ronald W. Waldby, Allan L. Wasserman, Marion K. Weberlein, Francis D. Wreggelsworth, Walter F. Zander.

University of Minnesota.—At the 1955 commencement exercises of the School of Veterinary Medicine, University of Minnesota, the following 46 candidates were presented for the D.V.M. degree:

Donald M. Barnes
Jack M. Bennett
Richard F. Dean
Gerald G. Drehmel
Lauren A. Dunn
Ward D. Gilbertson
Fritz P. Gluckstein
Warren O. Hartman
Roy E. Hendricks
Gerald A. Jacobson
Jesse A. Jacobson
Arthur S. Johnson
Dean F. Johnson
Mark A. Jurek
John L. Ketola
Gene R. Kind
James F. Krier
Howard H. Krueger
Gordon J. Kubesh
Laverne C. Larson
Alvin D. Lebeck
Michael Marmesh
Roger E. Meisner
Donald O. Nachtigal
Claude J. Nelson
Orin H. Osborn
Donald W. Pallesen
Leslie A. Payne
Victor Perman
John L. Prouty
Kenneth D. Quist
James D. Russell
Kenneth W. Rye
Leonard W. Scarr
Curtis T. Schafer
Roland R. Skaife
Russell C. Smith
Arthur L. Solie
Eugene C. Stelter
Leland S. Sturlaugson
Clarence A. Tervola
Earl S. Thompson
Edward J. Tomsche
Donald L. Welch
Hugh C. Williams
William A. Zwiener

Graduating Class, 1955, School of Veterinary Medicine, University of Minnesota

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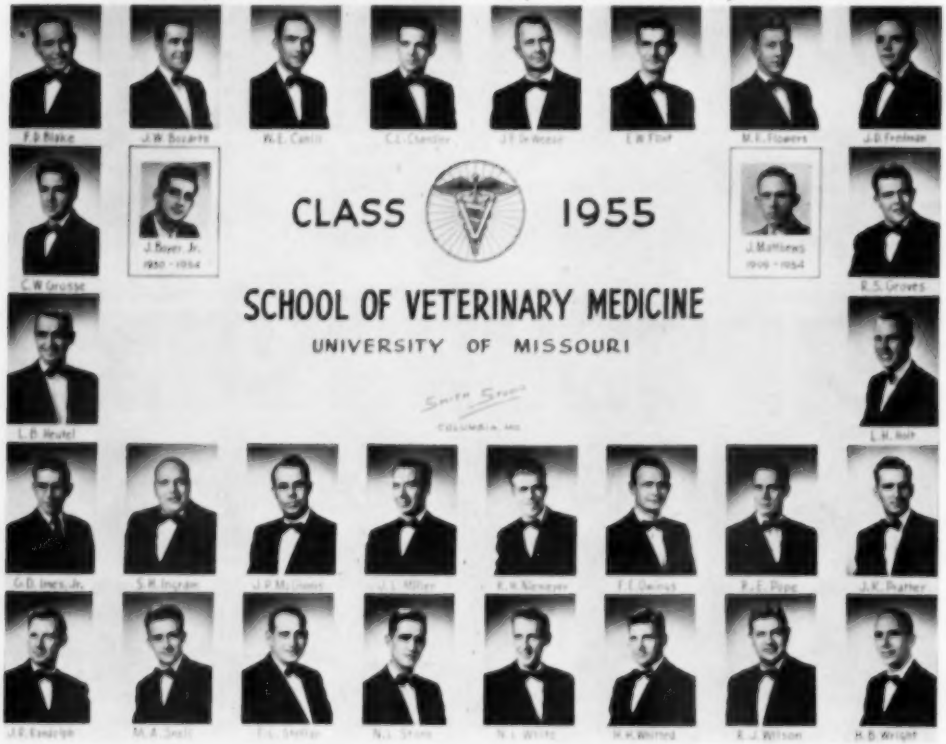
University of Missouri.—At the 1955 commencement exercises of the School of Veterinary Medicine, University of Missouri, the following 28 candidates were presented for the D.V.M. degree:

Donald F. Blake
James W. Bozarth
William E. Cahill
Clyde L. Chandler
Joyce E. DeWeese
Ernest W. Flint
Marion R. Flowers
John Fredman
Charles W. Grosse
Robert Groves
Lee Heutel
Leland H. Holt
George D. Imes, Jr.
Sidney H. Ingram
J. P. McGinnis
J. Louis Miller
Kenneth H. Niemeyer
Fon E. Owings
Robert E. Pope
James K. Prather
James R. Randolph
Anderson Snell
Fred L. Steffan
Nelson L. Stone
Nelson L. White
Harold H. Whitted
Raymond J. Wilson
Harold B. Wright

(Picture is on page 174)

Graduating Class, 1955, School of Veterinary Medicine, University of Missouri



Graduating Class, 1955, New York State Veterinary College, Cornell University

Front row (left to right)—David C. Kradel, Jane R. Newman, Dr. Gordon Danks, Dr. Myron G. Fincher, Dr. Malcolm E. Miller, Dean William A. Hagan, Dr. Hugh H. Dukes, Dr. Ellis P. Leonard, Dr. Dorsey W. Bruner, Dr. Robert W. Kirk, Richard J. Delgado.

Second row—Herbert C. Dietrich, Joseph Stuart, Frank L. Krohn, William L. Johnston, Edwin T. Presley, Robert B. Hillman, Alfred C. Clausen, Douglas F. McBride, Robert E. Cornell, Jr., Herbert L. Bandemer, Alfred I. Friedlander, Samuel J. Galpin, Bernard S. Hersborn.

Third row—Arthur J. Friderici, Lee A. Wallace, Allen C. Braemer, Robert V. Manning, Benjamin A. Rasmussen, Thomas J. Murtha, Jules Aaronson, Robert G. Little, Jr., Thomas W. Garbutt, John Alexander, Howard J. Terwilliger, Richard F. Leskovar, Gerald J. Sacks, Patrick E. Kelley, Max E. Freeman, Frederick H. Holmes.

Back row—James P. Childress, Robert G. Kohler, John C. Meek, Myles A. Greenberg, Bruce W. Calnek, Arthur J. Kowalk, Donald G. Beck, John W. Flemer, Richard C. Van Name, David E. Harling, John Pentek, Jr., Burton Saunders, Harry V. Tweddle, Donald E. Pelloth, Robert L. Kennedy, Howard A. Hochman.

Cornell University.—At the 1955 commencement exercises of the New York State Veterinary College, Cornell University, the following 48 candidates were presented for the D.V.M. degree:

Jules Aaronson
John R. Alexander
Herbert L. Bandemer
Donald G. Beck
Allen C. Braemer
Bruce W. Calnek
James P. Childress
Alfred C. Clausen
Robert E. Cornell, Jr.
Richard J. Delgado
Herbert C. Dietrich
John W. Flemer
Max E. Freeman
Arthur J. Friderici
Alfred I. Friedlander
Samuel J. Galpin
Thomas W. Garbutt
Myles A. Greenberg
David E. Harling
Bernard S. Hershhorn
Robert B. Hillman
Howard A. Hochman
Frederick M. Holmes
William L. Johnston
Patrick E. Kelley
Robert L. Kennedy
Robert G. Kohler
Arthur J. Kowalk
David C. Kradel
Frank L. Krohn
Richard F. Leskovar
Robert G. Little, Jr.
Robert V. Manning
Douglas F. McBride
John C. Meek
Thomas J. Murtha
Jane R. Newman
Donald E. Pelloth
John Pentek, Jr.
Edwin T. Presley
Benjamin A. Rasmusen
Gerald J. Sacks
Burton Saunders
Joseph Stuart
Howard J. Terwilliger
Harry V. Tweddle
Richard C. Van Name
Lee A. Wallace

• • •

Ohio State University.—At the 1955 commencement exercises of the College of Veterinary Medicine, Ohio State University, the following 68 candidates were presented for the D.V.M. degree:

Charles D. Ackley
John G. Bee
Albert D. Bellamy
Harold F. Bloom
William D. Bonifield
Harry W. Brown, Jr.
Rodney K. Burroughs
Marvin J. Cain
Robert E. Cope
David R. DeLong
David M. Drenan
Robert K. Dunton
Wynn F. Easterly
Orviel W. Fallang
Phillip L. Edmiston
Kenneth D. Fitch
Everett Fleming, Jr.
George E. Frank
Arthur Freeman
Martin F. Fuhrer
James L. Gabel
Donald B. Gisler
Jay E. Graber
Jack K. Grigor
Earl A. Grimm
Ralph J. Haehn
Jack Haggard
Donald C. Haines
Fred A. Hall
Gerald E. Hamilton
William J. Hassig
Newell G. Hicks
Harold B. Hubbard
Louis C. Huesmann
Evan S. Hughes
Edward W. Immke
Michael Inverso
Dale K. Johns
Max C. Joseph
Theodore Kistner
Erwin M. Kohler
Fred G. Leininger
John F. Long
Hollis Z. Lougheed
Basil J. Matchett
Edward L. Menning
Donald G. Miller
Eugene G. Miller
William R. Miller
John E. Norberg
Gilbert J. Papay
James W. Parcher
Harvey Pinkston
Quentin L. Questel
Ralph R. Rainier
Richard S. Ray
Clifton W. Richert
Joseph E. Rinehart
Charles E. Roesser
John H. Simpson
Joie W. Skaggs
John S. Theiss
Jerome A. Theobald
John R. Vorhies
Earl Weaver
Harry E. Wendler
Jerry T. Wills
Jack E. Wilt

(Picture is on page 176)

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Oklahoma A. & M. College.—At the 1955 commencement exercises of the School of Veterinary Medicine, Oklahoma A. & M. College, the following 31 candidates were presented for the D.V.M. degree:

John L. Axlin
Harrison A. Brown
James E. Carpenter
William J. Carson
Gwyn Chapin
James C. Cooper
John C. Day
Frederick Feibel
Leo W. Ford
Charlton P. Freeman
Dan E. Goodwin
Charles Harmon
Douglas Hawkins
Jack G. Hill
Donald L. Hohmann
Robert Hudson
Bryan Hutchens
Fred L. Hutton
June D. Iben
John M. King
Harold Kopit
Merlin D. Kunkel
Glenn R. Orr
Philip T. Parker
Robert G. Reim
Ted M. Richardson
Lewis R. Stiles
Louie G. Stratton
James R. Taylor
George T. Vickers
Richard White

• • •

University of Pennsylvania.—At the 1955 commencement exercises of the School of Veterinary Medicine, University of Pennsylvania, the following 45 candidates were presented for the V.M.D. degree:

Lawrence E. Atkinson
John D. Beck, Jr.
David N. Bilder
James M. Brewer
Joseph G. Brewer
William H. Carr
Robert S. Clark
Peter H. Craig
Henry Cresswell
Warren N. Davis
Joseph W. Doran
Charles B. Fager, Jr.
Keith W. Gates
Robert W. Graham
John W. Higgins
Robert S. Hoge
Louis R. Humpton, III
Richard W. Kay
William F. Kline
Elmer H. Lerner
Bernard G. Levine
Orville G. Lewis
William A. Limberger, Jr.
Richard R. Ling
Walter F. Loeb
Irving I. Lutsky
Lea B. McGovern
Millard M. Mershon
James F. Mock
Leroy T. Moore
Earl C. Pebley
William P. Ramsey
Jacquelinn A. Randolph
William H. Rhodes
Eugene J. Roszko
Clement A. Schmitt, Jr.
John W. Seddon
William W. Stimson
George H. Swart
Daniel N. Tapper
Alexander C. Tong
Donald R. Waugaman
Daniel Weiner
George P. Wilson, III
Robert J. Woods

(Picture is on page 177)

• • •

Texas A. & M. College.—At the 1955 commencement exercises of the School of Veterinary Medicine, Texas A. & M. College, the following 57 candidates were presented for the D.V.M. degree:

T. F. Abbott
G. D. Boring
J. S. Burch
H. F. Cable
F. R. Carloss
C. M. Cocanougher
J. E. Cook
W. A. Criswell
E. W. Dancer
D. A. Darter
G. C. Drew
W. A. Dunn
P. R. Durham
R. O. Fowler
M. L. Friedrich
R. W. George
F. M. Graves, Jr.
R. A. Hoffman
A. J. Holt, Jr.
J. J. Hosek
R. M. LeCour
S. W. Levingston, Jr.
C. W. Livingston, Jr.
R. L. Loftin
L. L. McCarthy
J. M. Monsell, Jr.
R. W. Moore
T. E. Murchison
T. R. Murtishaw, Jr.
A. G. Perry
L. W. Pessarra
A. G. Pessin
H. T. Pritchard, Jr.
B. B. Ray
Julio Reyes
E. T. Rowe
A. K. Samter
F. N. Sims
S. J. Smith, Jr.

(Continued on page 177)

Graduating Class, 1955, College of Veterinary Medicine, Ohio State University

Top row (left to right)—Charles E. Roesser, Phillip L. Edmiston.

Second row—Theodore Kistner, Arthur Freeman, Erwin M. Kohler, Jack K. Grigor.

Third row—John F. Long, Basil J. Matchett, David R. DeLong, Ralph R. Rainier, Max C. Joseph, Martin F. Fuhrer, Everett Fleming, Jr., Earl A. Grimm.

Fourth row—Richard S. Ray, Eugene G. Miller, Edward L. Menning, William R. Miller, Clifton W. Richert, James W. Parcher, Jerry T. Wills, Robert E. Cope, Donald G. Miller, John H. Simpson, Marvin J. Cain.

Fifth row—John R. Vorhies, Edward W. Immke, Orviel W. Fallang, Evan S. Hughes, Ralph J. Hachn, Gerald E. Hamilton, Harry E. Wendler, Rodney K. Burroughs, Joie W. Skags, John E. Norberg, Harry W. Brown, Jr.

Sixth row—Jerome A. Theobald, Jack Haggard, William D. Bonifield, David M. Drenan, John S. Theiss, Hollis Z. Lougheed, Gilbert J. Papay, James L. Gabel, Quentin L. Questel, Jack E. Wilt, George E. Frank.

Seventh row—Harold B. Hubbard, Donald C. Haines, John G. Bee, Earl Weaver, Michael Inverso, Jay E. Graber, William J. Hanig, Wynn F. Easterly, Joseph E. Rinehart, Fred A. Hall, Kenneth D. Fitch.

Bottom row—Louis C. Huesmann, Newell G. Hicks, Robert K. Dunton, Charles D. Ackley, Harvey Pinkston, Donald B. Gisler, Albert D. Bellamy, Harold F. Bloom, Fred G. Leininger, Dale K. Johns.

(Continued from page 175)

S. C. Spruill
E. T. Stanford
W. R. Stevens
R. H. Terk
E. L. Tieken
W. A. Trocquet
P. R. Turner
M. H. Vaughan
M. A. Waguespack, Jr.
Lawrence Waidhofer
D. C. Walther
G. L. Watts
B. R. Westbrook
D. E. Williams
C. E. Willis
Edgar R. Willmann
J. B. Wilson

• • •

University of Toronto.—At the 1955 commencement exercises of the Ontario Veterinary College, University of Toronto, the following 59 candidates were presented for the D.V.M. degree:

James R. Arnott
Barbara F. Bradbury
Ross A. Beardall
Eric Broughton
Donald R. Casorso
James R. Clarke
William N. Dale
William H. Davis
Waldo F. Dingwell
William G. Drennan
Donald M. Elliot
David Flatt
Gordon R. Flook
Thomas D. Ford
William J. Forrest
Torgny N. Fredrickson
Harold C. Gibbs
Gordon F. Godkin
Margaret L. Godkin
Lawrence E. Gray
William F. Hanlon
James N. Henry
Ronald S. Horning
Richard E. Jarvis
Albert M. Jonas
Theodore R. Julia
Lars H. Karstad
Stewart G. Leedham
Frank N. Lester
Donald R. Lingard
Howard G. Martin
Thomas M. Maxwell
Olgerts P. Miniats
Audrey E. Morrison
George K. MacQuarrie
Robert D. McIlelwain
Joseph C. McIsaac
William J. McLean
Ronald G. North
William R. Olivet
William A. Pallitter
Donald D. Payne
Thomas J. Pridham
John H. Reed
Carleton B. Ring
Ray M. Sammons
Harold R. Sherman
Elmer K. Smith
Norman E. Stanger
Edwin F. Stula
Ian Thorsen
Francis Veroni
William H. Vivian
Bruce G. Watson
John W. Waye
William G. Whittick
Lynn H. Williams
Merlin E. Wilson
George V. Zatlokal

Graduating Class, 1955, School of Veterinary Medicine, University of Pennsylvania

First row (left to right)—Lawrence E. Atkinson, John D. Beck, Jr., David N. Bilder, James M. Brewer, Joseph G. Brewer, William H. Carr, Robert S. Clark, Peter H. Craig, Henry Cresswell.

Second row—Warren N. Davis, Joseph W. Doran, Charles B. Fager, Jr., Keith W. Gates, Robert W. Graham, John W. Higgins, Robert S. Hoge, Louis R. Humpton, III, Richard W. Kay.

Third row—William F. Kline, Elmer H. Larner, Bernard G. Levine, Orville G. Lewis, William A. Limberger, Jr., Richard R. Ling, Walter F. Loeb, Irving I. Lutsky, Lea B. McGovern.

Fourth row—Millard M. Mershon, James F. Mock, Leroy T. Moore, Earl C. Pebley, William P. Ramsey, Jacquelinn A. Randolph, William H. Rhodes, Eugene J. Roszko, Clement A. Schmitt, Jr.

Last row—John W. Seddon, William W. Stimson, George H. Swart, Daniel N. Tapper, Alexander C. Tong, Donald R. Waugaman, Daniel Weiner, George P. Wilson, III, Robert J. Woods.

Tuskegee Institute.—At the 1955 commencement exercises of the School of Veterinary Medicine, Tuskegee Institute, the following 12 candidates were presented for the D.V.M. degree:

George P. Harris
Frazier E. Hemphill
Gordon L. Henderson
Joseph A. Jones
Allison P. McCottry
Arturo Pinto, Jr.
Ptolemy A. Reid
Thomas N. Reid
Louis M. Singleton
Paul L. Taylor
Lawrence B. Williams
Donald Wilson

• • •

State College of Washington.—At the 1955 commencement exercises of the College of Veterinary Medicine, State College of Washington, the following 41 candidates were presented for the D.V.M. degree:

Willard J. Ambrose
Charles K. Anderson
William W. Armfield
William F. Bentley
William M. Blackmore
Melford E. Boggs
Wilmer D. Bohlke
William W. Brock
Lauren S. Brown
Doris A. Carlon
Walter E. Carter
Kenneth B. Creer
Eugene E. Curnow
James T. Dowe
Guy R. Fairbrother
R. Keith Farrell
Guilio C. Gobbato
George A. Goudy
Ira M. Gourley
Hans H. Grunbaum
Wilmer E. Hammerich
William H. Harris
Jerry A. Harsch
Paul Jacobsen
Albert J. Jenisch
Peter C. Kelsay
David E. Long
Vincent H. McEnany
Eugene C. Meiers
Ernest D. Montgomery
John D. Nelson
Norman W. Nelson
Melvin L. Newman
Jason I. Otter
Robert S. Pontius
Oliver S. Querin
James B. Rankin
Milton Skov
Henry A. Stokke
Raymond L. Turcotte
Frank D. Waldron

APPLICATIONS

Applicants — Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative Bylaws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., the names of applicants residing within the jurisdictional limits of the constituent associations shall be published once in the JOURNAL.

The following applicants have been certified as members of the constituent association that has jurisdiction over the area in which the applicant resides. This certification was made by the secretary of the constituent association in accordance with Section 2, Article X, of the Administrative Bylaws.

GRAY, LAWRENCE E.
12 Elm St., Truro, Nova Scotia.
D.V.M., Ontario Veterinary College, 1955.

(Continued on page 180)

Graduating Class, 1955, School of Veterinary Medicine, Tuskegee Institute

Graduating Class, 1955, College of Veterinary Medicine, Washington State College

Top row (left to right)—Willard J. Ambrose, Charles K. Anderson, William W. Armfield, William F. Bentley, William M. Blackmore, Melford E. Boggs, Wilmer D. Bohlke.

Second row—William W. Brock, Lauren S. Brown, Doris A. Carlon, Walter E. Carter, Kenneth B. Creet, Eugene E. Curnow, James T. Dowe.

Third row—Guy R. Fairbrother, R. Keith Farrell, Guilio C. Gobbato, George A. Goudy, Ira M. Gourley, Hans H. Grunbaum, Wilmer E. Hammerich.

Fourth row—William H. Harris, Jerry A. Harsch, Paul Jacobsen, Albert J. Jenisch, Peter C. Kelsay, David E. Long, Eugene C. Meiers.

Fifth row—Ernest D. Montgomery, Vincent H. McEnany, John D. Nelson, Norman W. Nelson, Melvin L. Newman, Jason I. Otter, Robert V. Pontius.

Bottom row—Oliver S. Querin, James B. Rankin, Milton Skov, Henry A. Stokke, Raymond L. Turcotte, Frank D. Waldron.

(Continued from page 178)

SCELI, DON E.
Mitchellville, Iowa.
D.V.M., Iowa State College, 1944.

TEPFER, DELOIS G.
1911 7th Ave., N., Fort Dodge, Iowa.
D.V.M., Kansas State College, 1914.

Applicants — Not Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative Bylaws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., notice of all applications from applicants residing outside of the judisdictional limits of the constituent associations, and members of the Armed Forces, shall be published in the JOURNAL for two successive months. The first notice shall give the applicant's full name, school, and year of graduation, post office address, and the names of his endorsers.

First Listing

ARSHADI, MORTEZA G.
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1955 Graduate Applicants

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative Bylaws to members in good standing of student chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

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University of Minnesota

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GIER, WALTER T., D.V.M., 12820 S. Harris Ave., Compton, Calif.
GIGSTAD, DALE C., D.V.M., Effingham, Kan.
GORDON, JOHN W., D.V.M., 1115 Custer Ave., Kansas City, Kan.
HODGSON, DONALD F., D.V.M., Rt. 1, Manhattan, Kan.
HUDSON, RICHARD E., D.V.M., 1123 Harrison, Topeka, Kan.
HUMPHREY, MARCUS R., D.V.M., Wisner, Neb.
JENKINS, HAROLD E., D.V.M., Gen. Del., Palmyra, Neb.
KING, GEORGE E., D.V.M., R.R. 4, Rushville, Ind.
KUTTLER, ROSS A., D.V.M., Tribune, Kan.
KVITLE, MARTIN D., D.V.M., 1410 N. 65th St., Wauwatosa, Wis.
LESLIE, EARL R., D.V.M., 920 N. Main St., Carlsbad, N. M.
MCCULLOUGH, CHARLES O., D.V.M., Box 631, Meade, Kan.
MERIWEATHER, NORMAN R., D.V.M., Miller, S. Dak.
MILLER, ROBERT B., D.V.M., Box 86, Eureka, Kan.
NOVAK, ROBERT L., D.V.M., Lost Springs, Kan.
OLSON, CHARLES L., D.V.M., 515 Magnolia, Newton, Kan.
OPHEIM, HOWARD D., D.V.M., 2104 Faris, Sioux Falls, S. Dak.
PARKER, RICHARD L., D.V.M., 1809 Leavenworth, Manhattan, Kan.
PAULICH, LEO F., D.V.M., 1202 N. Dellrose, Wichita, Kan.
PAUTZ, DUDLEY D., D.V.M., R.R. 3, Hiawatha, Kan.
PAYNE, JAMES K., D.V.M., Burrton, Kan.
PETTIT, MELVIN U., D.V.M., R.R. 3, Benkelman, Neb.
POLLARD, THOMAS D., D.V.M., 2002 Chase, Falls City, Neb.
RIZEK, EUGENE L., D.V.M., R.R. 1, Munden, Kan.
SAMBOL, RICHARD M., D.V.M., 7340 Barnes Dr., Bethel, Kan.
SCOTT, RIDGE L., D.V.M., 1839 Wood Ave., Kansas City, Kan.
SHIRES, MAURICE L., D.V.M., 2311 Jefferson St., Bellevue, Neb.
SIMPER, JAMES T., D.V.M., 351 E. 1st S., Pleasant Grove, Utah.
TAYLOR, DANFORTH D., D.V.M., Howard, S. Dak.
THERET, ELLSWORTH E., D.V.M., 20 W. Evans St., Rice Lake, Wis.
TUMA, ROBERT V., D.V.M., 242 E. 72nd St., New York, N. Y.
VICKERY, ROLLIN W., D.V.M., 250 North Bluff, Wichita, Kan.
WADDELL, DONALD L., D.V.M., 1219 Poyntz, Manhattan, Kan.
WAMPLER, RICHARD L., D.V.M., Courtland, Kan.
WEICH, CARROLL K., D.V.M., R.R. 1, Hoskins, Neb.
WILTFONG, M. J., D.V.M., 424 W. Wilton, Norton, Kan.

University of Missouri

BLAKE, FLOYD D., D.V.M., Morse Mill, Mo.
BOZARTH, JAMES W., D.V.M., Bates City, Mo.
CAHILL, WILLIAM E., D.V.M., 7019 Raytown Rd., R.R. 6, Hickman Mills, Mo.
CHANDLER, CLYDE L., D.V.M., 2312 N.W. 23rd Ct., Miami, Fla.
DEWEESE, JOYCE E., D.V.M., Marceline, Mo.
FLINT, ERNEST W., D.V.M., 8 "O" St., Columbia, Mo.
FLOWERS, MARION R., D.V.M., R.R. 2, Macon, Mo.
FREDMAN, JOHN D., D.V.M., 2100 Mason Rd., Burlington, Iowa.
GROSSE, CHARLES W., D.V.M., 5217 Independence Ave., Kansas City, Mo.
GROVES, ROBERT S., D.V.M., R.R. 1, Mexico, Mo.
HEUTEL, LEE B., D.V.M., Rt. 12, Box 294, Kirkwood, Mo.
HOLT, LELAND H., D.V.M., R.R. 1, Golden City, Mo.
IMES, GEORGE D., JR., D.V.M., 5415 E. 16th Terrace, Kansas City, Mo.
INGRAM, SIDNEY H., D.V.M., R.F.D. 9, Springfield, Mo.
MCGINNIS, JAMES P., D.V.M., 49 "R" St., Columbia, Mo.
MILLER, JACOB L., D.V.M., 813 Rollins, Columbia, Mo.
OWINGS, FON E., D.V.M., Keytesville, Mo.
NIEMEYER, KENNETH H., D.V.M., 7645 Delmar Blvd., St. Louis, Mo.
POPE, ROBERT E., D.V.M., 1207 Paquin, Columbia, Mo.
PRATHER, JAMES K., D.V.M., 301 Pershing Rd., Columbia, Mo.

RANDOLPH, JAMES R., D.V.M., 1131 W. Worley, Columbia, Mo.
SNELL, MARVIN A., D.V.M., R.R. 2, Paris, Mo.
STEFFAN, FRED F., D.V.M., 40 "R" St., Columbia, Mo.
STONE, NELSON L., D.V.M., Rt. 1, Farmington, Mo.
WHITE, NELSON L., D.V.M., Sarcoxie, Mo.
WHITTED, HAROLD H., D.V.M., 18 King St., Columbia, Mo.
WILSON, RAYMOND J., D.V.M., Pleasant Hope, Mo.
WRIGHT, HAROLD B., D.V.M., R.F.D. 2, Kearney, Mo.

University of Pennsylvania

GATES, KEITH W., V.M.D., Box 18, Adah, Pa.
HOGE, ROBERT S., V.M.D., 10 Bell Ave., Pittsburgh, Pa.
SCHMITT, CLEMENT A., JR., V.M.D., R.D. 1, Wheeling, W. Va.
WILSON, GEORGE P., III, V.M.D., 180 Longwood Ave., Boston, Mass.

Texas A. & M. College

DURHAM, PAUL R., D.V.M., Apt. B-8-A, College View, College Station, Texas.
LIVINGSTON, CHARLES W., JR., D.V.M., Texas Agricultural Experiment Station, Sub-station No. 14, Sonora, Texas.
VAUGHAN, MAURICE H., D.V.M., Rt. 2, Floyd, Va.

Washington State College*

AMBROSE, WILLARD J., D.V.M., 3314 N. Park Rd., Spokane, Wash.
ANDERSON, CHARLES K., D.V.M., c/o W. J. Ewing, 2318 N. 36th St., Boise, Idaho.
ARMFIELD, WILLIAM W., D.V.M., 2724 W. Kiernan Ave., Spokane, Wash.
BENTLEY, WILLIAM F., D.V.M., Box 104, College Station, Pullman, Wash.
BLACKMORE, WILLIAM M., D.V.M., 38-C S., Fairway, Pullman, Wash.
BOAIS, MELFORD E., D.V.M., Box 519, Cottage Grove, Ore.
BOHLKE, WILMER D., D.V.M., Rt. 1, Box 67, Selah, Wash.
BROCK, WILLIAM W., D.V.M., Dayville, Ore.
BROWN, LAUREN S., D.V.M., 870 E. Baseline, Hillsboro, Ore.
CARLON, DORIS, D.V.M., Riley, Ore.
CARTER, WALTER E., D.V.M., 6555 N. Interstate Ave., Portland, Ore.
CREER, KENNETH B., D.V.M., Alpine Animal Clinic, Provo, Utah.
CURNOW, EUGENE E., D.V.M., 2805 Elmore St., Seattle, Wash.
DOWE, JAMES T., D.V.M., Box 506, Calexico, Calif.
FAIRBROTHER, GUY R., D.V.M., 1000 N. Kimball Ave., Caldwell, Idaho.
FARRELL, R. KEITH, D.V.M., 31-D S. Fairway, Pullman, Wash.
GOBBATO, GIULIO C., D.V.M., Custer, Wash.
GOUDY, GEORGE A., D.V.M., 43-28th Ave., San Mateo, Calif.
GOURLEY, IRA M., D.V.M., 1133 Porter Ave., Ogden, Utah.
GRUNBAUM, HANS H., D.V.M., 3285 S.W. 78th Ave., Portland, Ore.
HAMMERICH, WILMER E., D.V.M., 1768 Silverado Trail, Napa, Calif.
HARRIS, WILLIAM H., D.V.M., 9638 47th S.W., Seattle, Wash.
HARSCH, JERRY A., D.V.M., 925 11th Ave., N., Seattle, Wash.
JACOBSEN, PAUL, D.V.M., Box 273, Morton, Wash.
JENISCH, ALBERT J., D.V.M., 2022 E. Fourth, Olympia, Wash.
KELSAY, PETER C., D.V.M., Box 373 C. S., Pullman, Wash.
LONG, DAVID E., D.V.M., Rt. 2, Box 105, Ferndale, Wash.
MCENANY, VINCENT H., D.V.M., 707 E. 38th Ave., Spokane, Wash.
MEIERS, EUGENE C., D.V.M., 814 Springs St., Pullman, Wash.
MONTGOMERY, ERNEST D., D.V.M., 2042 15th Ave., W., Seattle, Wash.
NELSON, JOHN D., D.V.M., 16700 Merchant Rd., Los Gatos, Calif.
NELSON, NORMAN W., D.V.M., Bannack Star Route, Dillon, Mont.
NEWMAN, MELVIN L., D.V.M., Rt. 3, Shelton, Wash.
OTTER, JASON I., D.V.M., 15 Dayton, Fresno, Calif.
PONTIUS, ROBERT V., D.V.M., 1201 North 2nd West, Bountiful, Utah.
QUERIN, OLIVER S., D.V.M., Rt. 1, Box 446, c/o C. C. Querin, Sunnyside, Wash.
RANKIN, JAMES B., D.V.M., 2360 Fairgrounds Rd., Salem, Ore.
SKOV, MILTON, D.V.M., 31-A S. Fairway, Pullman, Wash.
STOKKE, HENRY A., D.V.M., Box 2119, C. S., Pullman, Wash.
TURCOTTE, RAYMOND L., D.V.M., Columbus, Mont.
WALDRON, FRANK D., D.V.M., Rt. 2, Box 2AA, Ellensburg, Wash.

U. S. GOVERNMENT

General Hays New Army Surgeon General.—Major General Silas B. Hays, Army Medical Corps, on June 1, 1955, succeeded Major General George E. Armstrong as Surgeon General of the Army.

General Hays, a graduate (1928) of the medical school at the University of Iowa, accepted a commission in the Medical Corps, U. S. Regular Army, on Aug. 1, 1929. He was appointed chief of medical supply in the European theater of operations in 1944 and, in May of 1950, was assigned as surgeon, U. S. Army, Pacific, and later as surgeon, Japan logistical

command. He became deputy surgeon general in August, 1951, and was appointed major general July 5, 1952.

General Hays was awarded the Legion of Merit with Oak Leaf Cluster in September, 1945, in part "for guiding medical supply operations throughout the entire European continental operation."

General and Mrs. Hays reside at Walter Reed Army Medical Center, Washington, D. C.

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Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U.S.D.A. Agricultural Research Service are reported as of June 17, 1955:

NEW APPOINTMENTS

F. Donald Blake, National Stockyards, Ill.
James L. Dixon, Denver, Colo.
Gordon K. Fay, Lansing, Mich.
Walter T. Gier, Los Angeles, Calif.
Dale C. Gigstad, South St. Joseph, Mo.
Charles W. Grosse, Kansas City, Kan.
Lee B. Heutel, St. Louis, Mo.
Byron F. Hilliard, Nashville, Tenn.
Donald F. Hodgson, Omaha, Neb.
Charles J. Hyman, Salt Lake City, Utah.
Michael Inverso, Lincoln, Neb.
Royal Klofanda, Madison, Wis.
James F. Krier, Pierre, S. Dak.
Allison P. McCottry, South St. Paul, Minn.
William R. Miller, Lincoln, Neb.
Nicholas R. Newman, Jr., Cincinnati, Ohio.
James C. Nowlen, Madison, Wis.
Ernest G. Ongert, Columbus, Ohio.
Ollie U. Poth, Fort Branch, Ind.
Charles E. Puddy, Portland, Ore.
Joseph V. Sabaitis, Madison, Wis.
Richard M. Sambol, Kansas City, Kan.
Marvin A. Snell, St. Louis, Mo.
Edward T. Stanford, Nashville, Tenn.
Nelson L. Stone, St. Louis, Mo.
Dan E. Suther, St. Paul, Minn.
Meredith J. W. Tong, Topeka, Kan.

MILITARY FURLOUGH

Paul J. Homme, St. Paul, Minn.

RETIREMENT

Rush M. Johnson, Lincoln, Neb.

RESIGNATIONS

Leslie E. Bay, Kansas City, Kan.
Murray Feldman, New York, N. Y.
George W. Fischer, Fort Worth, Texas.
Finis E. Hilton, East Lansing, Mich.
Francis M. Jackson, Nashville, Tenn.
Joseph H. Robbins, Rochester, N. Y.
Marvin L. Sobule, Denver, Colo.

NAME CHANGE

Stanley K. Kasperavicius to Stanley K. Kasponis, Green Bay, Wis.

REEMPLOYMENT—Military and Transfer

Thomas H. Vardaman, from Auburn, Ala., to Washington, D. C.

CANCELLATION of Appointment

Norman W. Eyl, Denver, Colo.

DEATHS

Leopold Buyvid, Baltimore, Md.
Scott N. Shaw, Portland, Maine.
Clark E. Swail, Augusta, Maine.

TRANSFERS

Izidorius Alisauskas, from South St. Paul, Minn., to Springfield, Mass.
Stewart J. Couger, from Augusta, Maine, to Pierre, S. Dak.
James H. Duke, from Beltsville, Md., to Indianapolis, Ind.
Oswald H. Graham, from Mexico City, Mex., to St. Louis, Mo.
Russell S. Griffin, from Yakima, Wash., to Seattle, Wash.
Leonard Jackel, from Cleveland, Ohio, to New York, N. Y.
Elbert B. Jasper, from Columbus, Ohio, to Topeka, Kan.
Julius P. Kreier, from Mexico City, Mex., to Baltimore, Md.
Dearrold I. F. Palmer, from Omaha, Neb., to Columbus, Ohio.
Floyd S. Ratts, from West Plains, Mo., to Fort Dodge, Iowa.
Wendall L. Tarver, from Mexico City, Mex., to Lincoln, Neb.
Daniel F. Werring, from St. Paul, Minn., to Lincoln, Neb.

AMONG THE STATES AND PROVINCES

The deadline for news copy is the 24th of the month, two months preceding the month of issue

Arizona

Central Association.—On June 14, the regular monthly meeting of the Central Arizona Veterinary Medical Association was held in Chandler, with Dr. John Carney as host.

The meeting was held in two sections. For the large animal practitioners, there was a discussion of problems of animal disease regulatory work led by **Dr. D. Miller**, Phoenix, U.S.D.A., and **Dr. J. King**, Phoenix, state veterinarian. The small animal practitioners heard a discussion on diagnosis and treatment of coccidioidomycosis of dogs by **Dr. K. Maddy** of the U. S. Public Health Service.

s/KEITH T. MADDY, *Secretary.*

California

Central Association.—The new officers of the Central California Veterinary Medical Association, all of Fresno, are Drs. Paul A. Carlson, president; Herbert Piper, vice-president; and Wilfred Pimentel, secretary-treasurer.

The May meeting of the Association was a family picnic in Roeding Park, Fresno.

s/HERBERT PIPER, *Retiring Secretary.*

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Tulare County Association Formed.—The veterinarians of Tulare County have formed a new group known as Tulare County Veterinarians. The regularly scheduled meetings are the second Thursday of each month. The constitution for the new Association was drawn up and approved on May 26, 1955, and the following officers were elected to serve until Jan. 1, 1956: Drs. Leo O. Henrich, Tulare, president; Robert Dove, Porterville, vice-president; and R. B. Barsaleau, Visalia, secretary-treasurer.

s/R. B. BARSALEAU, *Secretary.*

Death of Dr. Fred W. Wood.—Dr. Fred W. Wood (COR '07), former veterinary medical director of Cutter Laboratories, Berkeley, died suddenly of a heart attack at his home in Lafayette on April 16, 1955, at the age of 74. Born at Richford, Vt., in 1881, Dr. Wood went to the Philippines after receiving his D.V.M. degree and was associated with the bureau of animal industry there for several years on the production of serum and virus for prevention of rinderpest. He became associated with Cutter Laboratories in 1914 and retired in 1946. Widely know and respected in veterinary medical circles and by the livestock industry, Dr. Wood made many contributions to veterinary science.

Colorado

Colorado Association Establishes Newsom Memorial Fund.—A memorial loan fund to provide loans to deserving junior, senior, and graduate students enrolled in the school of Veterinary Medicine at Colorado A. & M. College is being sponsored by the Colorado Veterinary Medical Association in the memory of Dr. I. E. Newsom.

Money for the fund is being solicited from graduates of the School of Veterinary Medicine, Colorado A. & M. College, from enterprises associated with the veterinary profession, from livestock associations, and from former friends and acquaintances of Dr. Newsom.

It has been proposed that graduates of the School of Veterinary Medicine contribute to this fund in the amount of $5 for each year they have been out of college.

Dr. Newsom served as head of the Department of Pathology, dean of the School of Veterinary Medicine, dean of the Graduate School, vice-president of the College, and, in 1948, president of Colorado A. & M. College. He was also active in the AVMA, and the Conference of Research Workers on Animal Diseases in North America.

District of Columbia

District Association.—The District of Columbia Veterinary Medical Association held their second and third quarterly meetings of 1955 at the Army Medical Graduate School, Walter Reed Hospital on March 8 and May 10, respectively.

Dr. John T. McGrath of the Pathology Department, University of Pennsylvania School of Veterinary Medicine, gave an illustrated talk on "Intracranial Pathology of Dogs," at the March meeting.

At the May meeting, **Dr. George T. Herrell,** M.D., dean of the College of Medicine and professor of medicine at the Florida Medical School, Gainesville, presented the first annual honorary talk entitled, "Training for Service in the Health Fields."

s/CHARLES G. DURBIN, *Secretary.*

Florida

South Florida Association.—On May 17, at the regular meeting of the South Florida Veterinary Society at the Seven Seas Restaurant in Miami, the following officers were elected: Drs. R. P. Knowles, Miami, president; M. B. Teigland, Miami, president-elect; E. D. Stoddard, Miami, secretary; and J. B. O'Quinn, Hialeah, treasurer.

s/E. D. STODDARD, *Secretary.*

Idaho

Dr. MacInnis Joins Washington State College Faculty.—Dr. Gordon A. MacInnis (OSU '50), who has been acting assistant station veterinarian for the Department of Veterinary Science at the University of Idaho, has joined the faculty of the College of Veterinary Medicine, Washington State College, Pullman.

Dr. Donald W. Marble (WSC '51) has taken Dr. MacInnis' place at the University of Idaho.

s/JAMES W. BAILEY,
(Acting) Station Veterinarian.

Illinois

Mississippi Valley Picnic.—Members of the Mississippi Valley Veterinary Medical Association and their families enjoyed their annual picnic at the Soangetaha Country Club in Galesburg on June 26.

s/WILLIAM L. BEER, *Secretary.*

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Conference on Artificial Insemination.—**Drs. H. Hardenbrook** and **L. T. Boley,** University of Illinois, Urbana, and **W. E. Dreher,** Shawano, Wis., were on the program of the North Central Regional Conference on Artificial Insemination held at the Hotel Sherman in Chicago on April 14-15, 1955.

Indiana

Sixth District Association.—At the June 1 meeting of the Sixth District (Ind.) Veterinary Medical Association in Sheridan, **Mr. W. B. Van Aken** of Coldwater, Mich., father of Dr. William B. Van Aken, Kirklin, spoke and showed a film on training of bird dogs and Labrador Retrievers.

s/J. L. KIXMILLER, *Resident Secretary.*

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Northwestern Association.—The Northwestern Indiana Veterinary Medical Association met in Brook on May 26 to hear **Dr. V. W. Gellen** of the Corn States Serum Company, speak on plants that are toxic to animals. Dr. Gellen also displayed specimens of many of the plants he discussed.

The women were entertained at the Decker residence. Dr. and Mrs. N. K. Decker were hosts to the group.

s/J. L. KIXMILLER, *Resident Secretary.*

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Southwestern Association.—At the May 19 meeting of the Southwestern Indiana Veteri-

nary Medical Association at Fort Branch, the assistant state and federal district veterinarians discussed cooperation of the practitioner in the blood testing of cattle. Young veterinarians were encouraged to give more attention to treatment of ailments of horses.

s/J. L. KIXMILLER, *Resident Secretary.*

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Tenth District Association.—The Tenth District (Ind.) Veterinary Medical Association met in Cumberland on May 19. The guest speaker was **Professor J. H. Conrad** of the swine nutrition department of Purdue University. He spoke on better nutrition for swine. This was followed by a good discussion.

The women were entertained at the Showalter residence. Dr. and Mrs. R. A. Showalter were hosts.

s/J. L. KIXMILLER, *Resident Secretary.*

Iowa

Conference for Veterinarians.—The annual conference for veterinarians, sponsored by the Division of Veterinary Medicine, Iowa State College, was held at the College on July 26-27, 1955.

The following guest speakers spoke on the program: **Drs. R. E. Nichols,** University of Wisconsin, Madison, spoke on bloat; **John Arnold,** University of Minnesota, St. Paul, teat surgery; **W. J. Kilpatrick,** Mediapolis, mastitis; **J. W. Pirie,** Cedar Rapids, artificial insemination; **A. W. McClurkin,** University of Wisconsin, Madison, pneumoenteritis of calves; **M. J. Swenson,** Kansas State College, Manhattan, ketosis complex; **H. S. Bryan,** University of Illinois, Urbana, bovine leptospirosis; and **A. H. Frank,** Agricultural Research Service, Beltsville, Md., bovine vibriosis.

The following faculty members of Iowa State College also participated in the program: **Drs. F. K. Ramsey, B. W. Kingrey, C. C. Culbertson, John Herrick,** and **Dean I. A. Merchant.**

s/PAUL C. BENNETT.

Kansas

Among those who attended the fiftieth anniversary of the founding of the School of Veterinary Medicine at Kansas State College were (left to right)—Dr. W. A. Hagan, Dean Emeritus R. R. Dykstra, Dr. E. F. Kubin, and Dr. E. E. Leasure, dean. At the ceremony, the new veterinary hospital was named for Dr. Dykstra.

Massachusetts

Worcester County Association.—At the June 1 meeting of the Worcester County Veterinary Medical Association at the Sheraton Hotel in Worcester, **Dr. M. M. Mason** reported on his tour of duty with the Armed Forces Institute of Pathology, and **Drs. W. C. Maker, Robert Smith,** and **A. A. Vogel** comprised a panel which discussed removal of fetal membranes in cows.

s/DONALD HEY, *Secretary.*

Michigan

Michigan State Honors Veterinarians.—Twelve leaders in veterinary public health received special centennial awards at Michigan State College on June 27, at the banquet ending the first day of the School of Veterinary Medicine's symposium on reproduction and infertility. Dr. John A. Hannah, president of Michigan State, presented the citations.

The veterinarians to receive the awards included: Drs. J. H. Steele (MSC '41), Atlanta, Ga.; L. M. Hutchings (MSC '40) and L. P. Doyle (MSC '31), Lafayette, Ind.; W. R. Hinshaw (MSC '23), Camp Detrick, Md.; Wayne Riser (ISC '32), Skokie, Ill.; H. H. Dukes (ISC '18), Ithaca, N. Y.; Lee Roderick (OSU '15), Manhattan, Kan.; L. C. Ferguson (OSU '34), Wooster, Ohio; Hadley Marsh (GWU '12), Bozeman, Mont.; and F. R. Beaudette (KSC '19), New Brunswick, N. J.

Others from the public health field who received awards were: Drs. J. A. Reyniers, South Bend, Ind., and Gail Dack, University of Chicago.

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Symposium on Reproduction and Infertility.—On June 27-29, 1955, the School of Veterinary Medicine and the Agricultural Experiment Station, of the Michigan State University, presented a symposium on reproduction and infertility. The guest speakers were: **Drs. H. L. Easterbrooks,** University of Connecticut, Storrs; **Karl R. Reinhard,** Arctic Health Research Center, Anchorage, Alaska; **David E. Bartlett,** American Breeders Service, Chicago, Ill.; **R. M. Melampy,** Ph.D., Iowa State College, Ames; **D. T. Mayer,** Ph.D., University of Missouri, Columbia; **G. W. Salisbury,** Ph.D., University of Illinois, Urbana; **J. F. Sykes,** Animal Research Services, U.S.D.A., Beltsville, Md.; **S. R. M. Reynolds,** Department of Embryology, Carnegie Institution of Washington, Baltimore, Md.; **Warren O. Nelson,** Population Council, Inc., New York City; **F. X. Gassner,** Colorado A. & M. College, Fort Collins; **W. E. Petersen,** University of Minnesota, St. Paul; **E. L. Willett,** American Foundation for the Study of Genetics, Madison, Wis.; **L. C. Ulberg,** Mississippi State College, State College, Miss.; **J. D. Donker,** Ph.D., University of

Georgia, Athens; and **A. Dracy**, Ph.D., South Dakota State College, College Station.

The following members of the Michigan faculty also participated: **Drs. Lloyd M. Turk, Frank Thorp, Jr., Dean C. F. Clark, I. F. Huddleson**, and **W. F. Riley.**

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Mid-State Association.—The regular monthly meeting of the Mid-State Veterinary Medical Association was held May 26 at the Hotel Hayes in Jackson, with 37 members and guests present.

Guest speakers for the evening were **Drs. Glen Reed**, extension veterinarian and **Mr. George Parson**, extension dairyman, Michigan State College. They discussed the work of the Michigan Brucellosis Education Committee.

s/ROBERT E. KADER, *Secretary.*

Missouri

State Brucellosis Bill Modernized.—A statute on bovine brucellosis, passed by the Missouri state legislature on May 17, 1955, permits eradication on an area basis upon petition by 65 per cent of the cattle owners of the state, the cost to be borne by the state and federal governments. The three avenues of control are: plan A, test and slaughter; plan B, testing to determine the diseased animals, plus calfhood vaccination of all heifers coming into the herd with the privilege of retaining reactors for breeding purposes; plan C, calfhood vaccinations of all heifers with the privilege of shifting to plans A or B any time. Counties where dairying predominates must follow plan A and all counties must qualify for plan A by the end of three years.

All cattle 6 months of age entering the state, or bartered, offered for sale, or transported within the state must have passed a negative test for brucellosis within 30 days. Exceptions to this provision include: cattle from certified brucellosis-free herds; officially calfhood vaccinated animals until 30 months of age; steers and spayed heifers; registered bulls under 2 years old; beef type females under 12 months of age or those over 12 months, and brought in under quarantine, on special permit for feeding and grazing purposes only, which are to be sold for slaughter or tested for brucellosis within one year or within 165 days respectively; and bulls purchased on special permit for feeding or grazing only provided they are isolated, then tested or castrated within 30 days. An impoundment feature provides for the seizure of cattle held or transported in violation of this act until they are tested; reactors are shipped to slaughter and all costs are paid by the owner.

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Kansas City Association.—The Kansas City Veterinary Medical Association met at the American Hereford Headquarters Building on June 21. The guest speaker, **Dr. J. H. Edwards**, Senatobia, Miss., discussed (with illustrations) beef cattle practice.

s/BUSCH MEREDITH, *Secretary.*

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Greater St. Louis Association.—The annual Bar-B-Que of the Greater St. Louis Veterinary Medical Association was held at the home of Dr. and Mrs. Killian on June 5.

s/LUTHER E. FREDRICKSON, *Secretary.*

New York

New York State Veterinary College Honor Day Exercises.—The annual Honor Day exercises of New York State Veterinary College were held May 10, 1955, in Willard Straight Hall. The following awards were presented:

The Borden Veterinary Scholarship Award ($300) to the member of the senior class who attained the highest scholastic record in all veterinary studies for the first three years: Benjamin A. Rasmusen.

The Horace K. White Prizes for highest academic records: Benjamin A. Rasmusen, first ($75); Gerald J. Sacks, second ($25); John R. Alexander and William Leon Johnston, honorable mention.

The Jane Miller Prizes for the best work in veterinary physiology, to members of the sophomore class: Stanley A. Witzel, Jr., first ($25); Ernst Reit, second ($15); Donald H. Lein and John B. Tasker, Jr., honorable mention.

The James Gordon Bennett Prizes for students who show the greatest humaneness in handling animals: Benjamin A. Rasmusen, first ($25); Thomas W. Garbutt, second ($15); William L. Johnston, honorable mention.

The Anne Besse Prizes for the best work in medicine and clinical diagnosis: Lee A. Wallace, first ($25); Robert G. Little, Jr., second ($15); Frank L. Krohn, Robert B. Hillman, and John R. Alexander, honorable mention.

The Charles Gross Bondy Prizes for the best work in the courses in practical medicine and surgery of small animals: Herbert L. Bandemer, first ($25); Richard J. Delgado, second ($15); Gerald J. Sacks, honorable mention.

The Mary Louise Moore Prize for the best work in bacteriology ($40): Benjamin A. Rasmusen.

The Grant Sherman Hopkins Prize for greatest ability in animal morphology (a book): Edwin T. Presley.

The Prize of the Women's Auxiliary to the AVMA for special contributions of an extracurricular nature ($25); James P. Childress.

The New York State Veterinary Medical Society Award for outstanding achievement in the veterinary ROTC (gold keys): Robert G. Little, Jr., first, and Alfred C. Clausen, second.

The Sons of the American Revolution Award

for soldierly bearing and excellence in theoretical and practical work in the advanced ROTC course: Peter A. Huyler.

The Poultry Disease Essay Prize for the best essay on a topic in the field of poultry diseases ($50): Bruce W. Calnek.

The Alpha Psi Prize for student best equipped to advance standards of veterinary science ($25 U.S. Savings Bond): Benjamin A. Rasmusen.

The New York State Veterinary Medical Society Prizes for best case reports by senior students: David C. Kradel, first ($25); Lee A. Wallace, second ($15); Edwin T. Presley, third ($10); Thomas W. Garbutt, honorable mention.

The Sigma Iota Zeta Prize for sincere attitude of high purpose and achievement toward his profession ($25 U. S. Savings Bond): Herbert L. Bandemer. s/W. A. HAGAN, *Dean.*

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New York City Association.—The regular meeting of the Veterinary Medical Association of New York City, Inc., was held June 1 at the New York Academy of Sciences. The guest speaker, **Dr. Jacques Jenny**, University of Pennsylvania, spoke on the treatment of faulty unions by corrective osteotomy.

s/C. E. DECAMP, *Secretary.*

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State Society Presents Awards to ROTC Cadets.—At the formal annual inspection of the ROTC units on May 19, the following veterinary ROTC cadets were among the 50 outstanding students receiving awards: Robert G. Little, Jr., and Alfred C. Clausen, first and second place, respectively, for awards donated by the New York State Veterinary Medical Society for outstanding achievement in the veterinary ROTC program. Robert B. Hillman received the General Hospital Award for scholastic achievement; James P. Childress the Colonel George S. Smith Award for outstanding participation in summer camp training; and Peter A. Huyler, a third-year student, the Sons of the American Revolution Medal for leadership, soldierly bearing, and excellence in the theoretical and practical work in the veterinary ROTC program.

s/E. J. SUNDERVILLE, *V.C., U. S. Army.*

North Carolina

State Association.—The fifty-fourth annual meeting of the North Carolina State Veterinary Medical Association was held June 21-22, 1955, at the Hotel Kitty in Wrightsville Beach.

The program speakers and their subjects were: **Drs. R. P. Knowles**, Miami, Fla., small animal practice; **G. R. Moore**, Michigan State University, East Lansing, sterility in dairy cattle; **A. M. Mills**, University of Georgia, Athens, beef cattle; **D. C. Beard**, Concord, cortisone in small animal practice; **J. W. Peace**, High Point, ophthalmology in small animals; **J. E. Reed**, Gastonia, diseases of the mouth in small animals; and **D. E. Hightower**, Jefferson, diseases of sheep.

s/C. W. YOUNG, *Secretary.*

North Dakota

Personal.—Dr. John B. Watkins (ICS '51) has joined Drs. R. E. Shigley, J. O. Foss, and G. M. Christensen at the Minot Veterinary Clinic in Minot. Dr. Watkins formerly practiced at Grand Forks.

Ohio

Omega Tau Sigma Annual Recognition Banquet.—The annual recognition banquet of Gamma Chapter of Omega Tau Sigma fra-

Platoon of award recipients for the presidential review, May 19, 1955, including the five veterinary cadets who received awards.

ternity was held April 3 at the Beechwold Restaurant in Columbus. This banquet is held every spring for the purpose of recognizing the new initiates and making the Gamma Awards to members of the senior class who have made outstanding contributions to the fraternity, to

Dr. Guard responding to the presentation of the National Gamma Award.

an outstanding alumnus, both of Ohio State and Gamma Chapter of Omega Tau Sigma, and to some outstanding figure of national prominence in the veterinary profession. This year, 30 men were initiated into the active ranks.

The guests honored with the Gamma Awards were Jack K. Grigor, Erwin Kohler, and Earl Weaver, all of the senior class. The honored alumnus was Dr. John H. Collins of the Veterinary Medical Branch, Division of Medicine, Food and Drug Administration, Department of Health, Education, and Welfare.

The recipient of the National Gamma Award was Dr. Willard F. Guard, professor and chairman of the Department of Veterinary Surgery, College of Veterinary Medicine, Ohio State University. Dr. Guard is a member of several honoraries including Phi Zeta, Sigma Xi, and Phi Beta Phi. He is also a member of the Ohio State Veterinary Medical Association and of the AVMA.

s/RICHARD JOHNSON, *Chairman, Gamma Award Committee.*

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Conference for Veterinarians.—The twenty-fourth annual conference for veterinarians sponsored by the College of Veterinary Medicine, Ohio State University, Columbus, was held at the College on June 14-15, 1955.

The guest program speakers and their subjects were: **Drs. E. M. Baldwin,** Corn States Laboratories, Inc., Omaha, Neb., enterotoxemia of sheep and cattle; **T. H. Brasmer,** Danville, Ill., surgery in thoracic emergencies; **L. K. Firth,** Canton, hospital management; **J. L. Fuller,** Ph.D., director of Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine, inheritance of structural defects of dogs; **W. C. Hackett,** London, Ohio, virus diarrhea in cattle in Ohio; **J. R. Hay,** state veterinarian, disease control; **M. E. Hays,** Liberty, Ind., transmissible gastroenteritis of swine; **J. W. Hibbs,** Ph.D., Ohio Agricultural Experiment Station, Wooster, prevention of milk fever; **R. L. Knudson,** Animal Research Service, Animal Disease Eradication Branch, Ohio, federal disease control activities; **G. C. Poppensiek,** Veterinary Virus Research Institute, Ithaca, N. Y., hepatitis-distemper syndrome; and **W. R. Pritchard,** Purdue University, Lafayette, Ind., mucosal disease and virus diarrhea in cattle.

The following faculty members of the Ohio State University also addressed the group: **Drs. V. R. Cahill,** Ph.D., carcass changes due to hormone administration; **E. J. Catcott,** examination of the abdomen of the dog; **C. R. Cole,** toxicity of vitamin D for cattle; **C. D. Diesem,** hernias in dogs; **J. C. Dohnam,** blood transfusions in large animals; **A. A. Gabel** and **V. L. Tharp,** electroejaculation of the bull; **H. F. Grove,** dermatomycoses; **R. A. Griesmer,** hemogramic distortions in canine diseases; **G. A. Marsh,** poultry medication; **R. W. Redding,** diagnostic instruments; **R. L. Rudy,** palpation of bone injuries; **C. R. Smith,** examination of the canine heart; and **W. G. Venzke,** hormone nutrition in beef cattle.

s/W. R. KRILL, *Dean.*

Ontario

Dr. Schofield Retires.—Dr. F. W. Schofield, who retires this year after 34 years of service in the Department of Pathology and Bacteriology at the Ontario Veterinary College, and as professor and head of that department since 1945, was honored at a banquet on June 17 during a meeting of the alumni of that school. Dr. Schofield was born in Rugby, England, in 1889 and graduated from the Ontario Veterinary College in 1910. He was awarded the 12th International Veterinary Congress prize at the AVMA convention in Seattle in 1954.

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Refresher Course for Veterinarians.—A refresher course for veterinarians was conducted at the Ontario Veterinary College, Guelph, on June 16-18, 1955.

Guest speakers and their subjects included **Drs. L. M. Hutchings,** Purdue University, Lafayette, Ind., swine diseases; **P. C. Wang,** Brockville, Ont., foot rot in cattle; **Morris Erdheim,** Dawes Laboratories, Inc., Chicago, Ill., leptospirosis, also ruminant digestion; **V. C. R. Walker,** Toronto, Ont., spray vaccine for mink distemper; **C. A. Mitchell,** chief, Animal Pathology Division, Animal Disease Research Institute, Hull, Que., scrapie; **Walter Moynihan,** Health of Animals Division, Department of Agriculture, Ottawa, shipping fever; **R. S. Guthrie,** DeLaval Separator Co., Chicago, Ill., udder health; **C. L. McGilvray,** Toronto, small animal practice; and **K. F.**

Wells, veterinary director general of Ontario, challenge for veterinarians.

Participating faculty members and their subjects were: **Drs. C. K. H. Roe**, salt poisoning in swine; **J. A. Henderson**, foot rot in sheep; **W. T. Oliver**, poisoning; **A. J. Cawley**, therapeutics of the eye; **J. D. Schroeder**, neoplasia; **D. C. Maplesden**, milk fever; and **J. Archibald**, dermatology.

s/T. LLOYD JONES, *Principal.*

Pennsylvania

Bucks-Montgomery Association.—On June 8, **Mr. John Schwenk**, farm director of the Lehigh Valley Co-Operative Association, talked on artificial insemination of dairy cattle at the meeting of the Bucks-Montgomery Veterinary Medical Association.

s/VINCENT W. RUTH, *Secretary.*

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Graduate Courses to be Offered for Veterinarians.—The University of Pennsylvania's Graduate School of Medicine, whose students are graduate physicians and dentists, will offer courses for doctors of veterinary medicine next fall for the first time.

The announcement was made by Dr. George Morris Piersol, dean of the Graduate School of Medicine, and Dr. Mark W. Allam, dean of the University's School of Veterinary Medicine.

One purpose of the new courses is to prepare doctors of veterinary medicine for full-time teaching and research work in veterinary schools, where qualified clinicians are needed urgently, Dr. Allam said.

The courses, leading to the degree of master of veterinary medical science, in clinical specialties, will stress broad education in the basic medical sciences and their correlation with the diagnosis and treatment of clinical problems.

Facilities of the School of Veterinary Medicine and its 220-acre New Bolton Center, near Kennett Square, Pa., as well as those of the Graduate School of Medicine, will be used.

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Death of Dr. B. Frank Senseman.—Dr. B. Frank Senseman (UP '91), for 50 years an outstanding practitioner in Philadelphia who cared for some of the finest horses in that area, died on May 24, 1955, at the age of 93, in Bala Presbyterian Home in Philadelphia. Following graduation, he taught anatomy in the veterinary school at the University and then entered practice.

Dr. Senseman was a member of the local and state veterinary medical associations for many years. He joined the AVMA in 1908 and would have been made a life member this year.

He is survived by his widow, Mrs. Cora Hertzler Senseman, and a sister. Interment was in Eberly's Cemetery, Mechanicsburg, Pa.

South Carolina

State Association.—The forty-fifth annual meeting of the South Carolina Association of Veterinarians was held June 16-18, 1955, at the Hotel Columbia in Columbia, with 80 veterinarians in attendance.

The speakers and their subjects were: **Col. Frank Lee**, State Board of Health, Columbia, rabies; **Drs. E. M. Baldwin**, Corn States Laboratories, Omaha, Neb., distemper and rabies; **W. K. Magill, Herbert E. Riddle, George Moore**, and **Ted Brown**, panel discussion on large animal practice; **H. E. Kingman, Jr.**, Chicago, assistant executive secretary of the AVMA, work in the AVMA; **E. W. Causey**, University of Georgia, Athens, surgery in small animals; **Col. Frank Todd**, Washington, D. C., veterinarians in civil defense; **Drs. R. W. Carter**, Columbia, brucellosis; **A. H. Craig, Jr.**, Pitman-Moore Co., Indianapolis, Ind., sex hormones in veterinary practice; **Charles Rife**, Atlanta, Ga., economics in veterinary practice; **George T. Edds**, Fort Dodge Laboratories, Fort Dodge, Iowa, cattle practice; **E. M. Baldwin**, Corn States Laboratories, Omaha, Neb., sheep diseases; **Stuart Burnett, Glenn Lawhorn, Jr., Leon Willis**, and **Preston Jones**, panel discussion on small animal practice.

Those in attendance also enjoyed a tour of the Clemson Livestock Disease Laboratory at Pontiac.

s/WORTH LANIER, *Secretary.*

Texas

Postgraduate Continuation Courses.—During the summer of 1955, the School of Veterinary Medicine, Texas A. & M. College, offered the following postgraduate courses for veterinarians: on June 27, clinical laboratory diagnosis;

Washington

AVMA President A. H. Quin (right) and Washington State V.M.A. President Don Clark at the spring conference for veterinarians, which was held in April at Washington State College, Pullman.

July 18, postmortem techniques of small animals; August 1, postmortem techniques of large animals; and also on August 1, ophthalmology. The following faculty members cooperated in presenting these courses: Drs. W. C. Banks, R. H. Davis, E. D. McMurry, F. T. Lynd, R. J. Beamer, Hilton A. Smith, D. A. Johnson, and A. A. Price.

s/W. C. BANKS,
Supervisor of Postgraduate Programs.

Wyoming

State Association.—Thirty-eight Wyoming veterinarians attended the annual meeting of the Wyoming Veterinary Medical Association June 12 and 13 at Casper.

Dr. R. E. Pierson, Colorado A. & M. College, Fort Collins, presented pictures and a description of rhinitis and tracheitis of cattle; **Dr. J. E. Rasmussen,** chief of the Wyoming ARS, and **Dr. A. K. Kuttler** of the Washington ADE, summarized the accelerated brucellosis program in a discussion open to the members; **Dr. Richard L. Ott,** Washington State College, Pullman, spoke on the distemper complex of dogs and evaluation of liver tests for the dog; **Dr. J. D. Wheat,** University of California, Berkeley, presented pictures on large animal surgery and hereditary defects; **Mr. William Chapman,** commissioner of the Wyoming Department of Agriculture, described the activities of his department as they pertain to the veterinarian; and **Dr. A. H. Quin,** president of the AVMA, spoke of the importance of the veterinarian and discussed the mucosa-like diseases and their increasing importance.

Drs. Reuben Blackner, Lyman, and W. H. Lee, Powell, were awarded life membership in the organization by acclamation because of their retirement. Such a position retains their membership and is attested by an antelope hide suitably entitled and signed by all the members of the organization. In this regard, the Wyoming Board of Veterinary Examiners also honored Dr. H. E. Kingman, Sr., with a lifetime permit to practice in Wyoming. Last year, Dr. Kingman was made a life member of the association. Dr. L. N. Davidson of Sheridan was made an honorary member in recognition of his assistance to the veterinarians within the state. Dr. M. F. Weldner was presented with a scroll and pin honoring his more than 20 years with ADE branch of the U.S.D.A.

Officers elected for the coming year were: Drs. Bert Reinow, Pinedale, president; E. S. Norton, Lander, vice-president; and J. F. Ryff, Laramie, secretary-treasurer.

s/J. F. RYFF, *Secretary.*

VETERINARY MILITARY SERVICE

Major Dan Hightower Awarded Hoskins Medal.—During the graduation exercises held at Walter Reed Army Medical Center for 13 Army and Air Force veterinary officers who had completed a 17-week course at the Center's Army Medical Service Graduate School, Major Dan Hightower was awarded the Hoskins Memorial Medal. The bronze medal, originally authorized by the Army Surgeon General as a memorial to Dr. W. Horace Hoskins, is now awarded annually by the American Veterinary Medical Association to the student officer graduate attaining the highest general average during the postgraduate training period at Walter Reed. Major Hightower, a native of

Eighty-six veterinarians of the U. S. Air Force and Army stationed in England, Holland, Denmark, France, Germany, French Morocco, Libya, Saudi Arabia, and Greece attended a conference at Garmisch, Germany, April 6-7, 1955. Colonel Rowland W. Rushmore, command veterinarian, U.S.A.F.E., acted as official host of the meeting. The above picture was taken at Garmisch Leave and Rest Center during the conference.

Major Dan Hightower (left) receives the Hoskins Memorial Medal from Dr. A. H. Quin, president of the AVMA.

Eastland, Texas, is presently assigned to the Army Medical Service Meat and Dairy Hygiene School at Chicago.

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Public Health Degrees Awarded to Veterinary Officers.—The Army Medical Service has announced that Col. Joseph W. Manges at Johns Hopkins University, and Lt. Col. W. H. Dieterich at the University of Michigan, have received the M.P.H. degree.

Colonel Manges (KSC '35) is director of the Department of Veterinary Science in the Medical Field Service School, Fort Sam Houston, Texas. Colonel Dieterich (KSC '39) is head of the Veterinary Division of the medical laboratory at Tripler Army Hospital in Honolulu, Hawaii. Both served overseas during World War II.

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Major Merida W. Castleberry (right) receiving from Lt. Gen. A. R. Bolling, Third Army commander, the Third Army Certificate of Achievement for outstanding service as post veterinarian at Fort McPherson, Ga. Major Castleberry is the son of Dr. and Mrs. Guy Castleberry of Midwest City, Okla.

Veterinary Medical Students and Instructors at Walter Reed Medical Center.

Thirteen Army and Air Force veterinary officers were graduated from Walter Reed Army Medical Center's fourth class in veterinary medicine, on June 3.

Front row (left to right)—Capt. John D. Mosely, U.S.A.F., assistant coordinator of training for the Center's veterinary division; Lt. Col. William F. Collins; Lt. Col. Leslie C. Murphy, deputy director, Veterinary divison; Major William E. Rothe, coordinator of training; Lt. Col Weldon M. Couch; and Lt. Col. Charles W. Gollehon.

Second row—Major Richard E. Hineman; Major Lillis R. Wempe; Major Robert B. Breiner; Major Seymour E. Spanier; and Major William S. Gaston.

Third row—Major George O. Thomas; Capt. George M. Rose; Capt. Robert L. Brown; Major Dan Hightower; and Major William H. Wilson.

STATE BOARD EXAMINATIONS

Louisiana—The Louisiana State Board of Veterinary Medical Examiners will meet Sept. 14-15, at the Capitol Building, Baton Rouge, La. H. A. Burton, Box 1575, Alexandria, La., secretary.

West Virginia—The West Virginia Veterinary Medical Examining Board will hold its annual eaxmination on Aug. 22, 1955, at 9:00 a.m., in the Stonewall Jackson Hotel in Clarksburg, W. Va. Applications can be secured by contacting the secretary; applications must be in ten days prior to examination. Isaac H. Maxwell, Lost Creek, W. Va., secretary.

BIRTHS

Dr. (API '43) and Mrs. Walter W. Glazener, Hendersonville, N. Car., announce the birth of a son, Dennis Michael, on Feb. 6, 1955.

Dr. (COR '51) and Mrs. G. M. Christensen, Minot, N. Dak., announce the birth of a son, Paul Allen, on April 1, 1955.

Dr. (COL '51) and Mrs. Merwin Funk, Homedale, Idaho, announce the birth of a son, James Byron, on April 9, 1955.

Dr. (WSC '53) and Mrs. Ewald R. Klimke, Pittsburgh, Pa., announce the birth of a son, Douglas Arnold, on April 12, 1955. Dr. Klimke is at present serving in the Army Veterinary Corps.

Dr. (COL '54) and Mrs. Charles R. Hilbers, Lansing, Mich., announce the birth of a daughter, Susan Marie, on April 17, 1955.

Lt. (ONT '52) and Mrs. Arthur E. Maude, Brooklyn, N. Y., announce the birth of their second daughter, Carol Joyce, on May 16, 1955.

Dr. (OSU '50) and Mrs. E. D. Richards, Fergus Falls, Minn., announce the birth of their fifth child, Jonathan Paul, on May 23, 1955.

DEATHS

Hugh E. Berry (MCK '12), Staunton, Va., died Aug. 26, 1952. Dr. Berry was a general practitioner.

James S. Cattanach (AVC '94), New York, N. Y., died Feb. 24, 1955. Dr. Cattanach had specialized in equine practice.

Robert J. Fleming (MCK '14), 74, Spokane, Wash., died April 19, 1955. Dr. Fleming was a general practitioner.

Walter W. Gardiner (UP '96), 85, Moorestown, N. J., died April 13, 1955. Dr. Gardiner, a general practitioner, had served for 30 years as registrar of vital statistics for Moorestown and as tax assessor for 28 years. He had been a member of the AVMA.

Verl J. Garver (CIN '14), DeGraff, Ohio, died Nov. 1, 1954. Dr. Garver was a general practitioner.

Lester W. Ingram (COL '17), El Paso, Texas, died May 25, 1955. Dr. Ingram was a veteran of World War I and had retired from the Army as a major in 1933. He was buried in Fort Bliss National Cemetery with full military honors. Dr. Ingram had been a member of the AVMA. He is survived by his widow.

★**James R. Love** (OSU '07), 68, Pensacola, Fla., died Oct. 21, 1954. Dr. Love was employed by the U. S. Department of Agriculture for 36 years, and was veterinarian for Escambia County, Florida, from 1947 to 1954. He was instrumental in bringing livestock shows to the Pensacola Interstate Fair. Dr. Love, a veteran of World War I, was a member of the Presbyterian Church, the Kiwanis Club, and the AVMA. He is survived by his widow.

James H. Malone (CHI '91), 87, Kansas City, Kan., died Feb. 11, 1955. Dr. Malone had retired from practice several years ago.

★**Dr. John L. Wells** (KCB '15), 63, Kansas City, Mo., died suddenly July 20, 1955. An obituary will appear in the September issue.

★**Samuel C. Routh** (TEX '50), 35, Irving, Texas, died Jan. 3, 1955. Dr. Routh had practiced in Irving for five years. He was a member of the Dallas County and Texas State Veterinary Medical Associations and of the AVMA. He is survived by his widow, a son, and his parents.

★**B. Frank Senseman** (UP '91), 93, Philadelphia, Pa., died May 24, 1955. Dr. Senseman was admitted to the AVMA in 1908. An obituary appears on page 197 of this JOURNAL.

★**Stanley E. Taylor** (OSU '30), 57, Mansfield, Ohio, died of a heart attack on May 6, 1955. Dr. Taylor, a general practitioner, was a member of the Ohio State Veterinary Medical Association and of the AVMA. He is survived by his widow.

Jacob Van de Erve (CVC '10), 75, Mountain View, Calif., died May 24, 1955. Dr. Van de Erve, who was born in the Netherlands, had practiced in Minot, N. Dak., from 1908 to 1933. In later years, he was employed by the state of North Dakota and about two years ago he moved to California. He is survived by his widow, a son, a stepson, and two stepdaughters. Dr. Van de Erve had been a member of the AVMA.

★**Fred W. Wood** (COR '07), 74, Lafayette, Calif., died April 16, 1955. Dr. Wood was admitted to the AVMA in 1917. An obituary appears on page 192 of this JOURNAL.

★ Indicates members of the AVMA.

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COMING MEETINGS

Notices of Coming Meetings must be received by 4th of month preceding date of issue

American Veterinary Medical Association. Annual meeting. Municipal Auditorium, Minneapolis, Minn., Aug. 15-18, 1955. J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Louisiana Veterinary Medical Association, Inc. Annual meeting. Washington Youree and Captain Shreve Hotels, Shreveport, La., Aug. 24-25, 1955. R. B. Lank, Baton Rouge, La., secretary.

New Mexico Veterinary Medical Association. Annual meeting. Hilton Hotel, Albuquerque, N. M., Sept. 12-13, 1955. Charles Webster, 711 N. Quincy St., Roswell, N. M., secretary.

Canadian Veterinary Medical Association. Annual meeting. Bessborough Hotel, Saskatoon, Sask., Sept. 12-15, 1955. Claude Kealey, 1195 Wellington St., Ottawa 3, Ont., secretary.

New York State Veterinary Medical Society. Annual meeting. Hotel Statler, New York, N. Y., Sept. 14-16, 1955. Joan S. Halat, 803 Varick St., Utica, N. Y., acting executive secretary.

Colorado Veterinary Medical Association. Annual meeting. Steamboat Springs, Colo., Sept. 16-18, 1955. Walter R. Haas, Eaton, Colo., secretary.

Washington State Veterinary Medical Association. Annual meeting. Hotel Leopold, Bellingham, Wash., Sept. 23-24, 1955. R. E. Ebright, 2836 W. Maplewood St., Bellingham, Wash., general chairman.

Oklahoma A. & M. College. Conference for veterinarians. School of Veterinary Medicine, Oklahoma A. & M. College, Stillwater, Okla., Sept. 29-30, 1955. J. D. Friend, Department of Veterinary Anatomy, chairman.

New England Veterinary Medical Association. Annual meeting. Poland Spring House, Poland Spring, Maine, Oct. 2-5, 1955. Russell N. Abbott, Rockland, Maine, publicity chairman.

Purdue University. Annual short course for veterinarians. Purdue University, Lafayette, Ind., Oct. 5-7, 1955. L. M. Hutchings, head, Department of Veterinary Medicine.

South Dakota Veterinary Medical Association. Annual meeting. Cataract Hotel, Sioux Falls, S. Dak., Oct. 12-13, 1955. J. L. Noordsy, Marion, S. Dak., secretary.

Southern Veterinary Medical Association and Florida Veterinary Medical Association. Joint annual meeting. George Washington Hotel, Jacksonville, Fla., Oct. 16-19, 1955. A. A. Husman, 320 Agricultural Bldg., Raleigh, N. Car., secretary, Southern Association.

Eastern Iowa Veterinary Medical Association, Inc. Annual meeting. Hotel Montrose, Cedar Rapids, Iowa, Oct. 13-14, 1955. Wayne H. Thompson, Earlville, Iowa, secretary.

Association of Military Surgeons of the United States, Annual convention. Hotel Statler, Washington, D. C., Nov. 7-9, 1955. Address Secretary, Suite 718, New Medical Bldg., 1726 Eye St., N. W., Washington 6, D. C.

U. S. Livestock Sanitary Association. Annual meeting. Jung Hotel, New Orleans, La., Nov. 16-18, 1955. R. A. Hendershott, 1 W. State St., Trenton 8, N. J., secretary.

Foreign Meetings

Third International Congress of Biochemistry. Brussels, Belgium, Aug. 1-6, 1955. Claude Liebecq, 17 Place Delcour, Liege, Belgium, secretary general.

(Continued on p. 28)

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(COMING MEETINGS—*continued from p. 261*)

Regularly Scheduled Meetings

Atlanta (Ga.) Veterinary Society, the second Tuesday of every month at the Elks Home on Peachtree St., Atlanta, Ga. J. L. Christopher, Smyrna, Ga., secretary.

Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Harry L. Schultz, Jr., 9011 Harford Rd., Baltimore, Md., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of each month. E. Paul, Redwood City, Calif., secretary.

Cedar Valley Veterinary Association, the second Monday of each month, except January, July, August, and October, at Black's Tea Room, Waterloo, Iowa. D. A. Buchanan, Grundy Center, Iowa, secretary.

Central Alabama Veterinary Association, the first Thursday of each month. G. J. Phelps, Jr., Montgomery, Ala., secretary.

Central Arizona Veterinary Medical Association, the second Tuesday of each month. F. R. Benton, 302 South Country Club Dr., Mesa, Ariz., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Wilfred Pimentel, 3455 S. Elm Ave., Fresno, Calif., secretary.

Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel in Greensboro, N. Car. R. T. Copeland, 1800 Walker Ave., Greensboro, N. Car., secretary.

Central Indiana Veterinary Medical Association, the second Wednesday of each month. Charles J. York, P. O. Box 1656, Indianapolis 6, Ind., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Mark E. Davenport, Jr., 215 S. Edgewood Ave., La-Grange, Ill., secretary.

Coastal Bend (Texas) Veterinary Association, the second Wednesday of each month. J. Marvin Prewitt, 4141 Lexington Blvd., Corpus Christi, Texas, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. D. I. Lee, Sac City, Iowa, secretary.

Cuyahoga County (Cleveland, Ohio) Veterinary Medical Association, the first Wednesday of each month, September through May (except January), at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Ed. R. Jacobs, 5522 Pearl Rd., Cleveland, Ohio, secretary.

(*Continued on p. 30*)

Call your veterinarian early...

SAVE HIS TIME... SAVE YOUR LIVESTOCK

More livestock on farms today, with increased demands for higher production per animal, means this: Your veterinarian has a gigantic task. He must serve more farm animals, and more valuable animals, than ever before.

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Among these, Squibb veterinary drugs are widely recognized for their reliability, efficacy and uniformity.

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VETERINARY

STECLIN (Tetracycline Hydrochloride)

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newest member of the family of Squibb veterinary products—offers many noteworthy advantages in the treatment of infections caused by tetracycline-susceptible organisms in domestic animals:

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vials

Steclin Hydrochloride Veterinary for parenteral administration is supplied in vials of 100 mg., 1.0 gm. and 2.5 gm. crystalline tetracycline hydrochloride with ascorbic acid as a buffer, and procaine hydrochloride and magnesium chloride.

Solutions of Steclin Veterinary for parenteral use may be prepared with Water for Injection U.S.P., Dextrose Solution U.S.P. or Sterile Isotonic Sodium Chloride Solution U.S.P. Steclin for parenteral use should be given by deep intramuscular injection or by intraperitoneal administration.

RECOMMENDED DAILY DOSAGE: ***For small animals,*** **5 mg. per pound of body weight, administered in divided doses every 6 to 12 hours;** ***for larger animals,*** **1 to 2 mg. per pound of body weight, administered once per day.**

capsules

Capsules of Steclin Hydrochloride Veterinary for oral administration are supplied in bottles of 100, each capsule containing 250 mg. crystalline tetracycline hydrochloride.

RECOMMENDED DAILY DOSAGE: ***For small animals,*** **25 to 50 mg. per pound of body weight, administered in divided doses every 6 to 12 hours;** ***for larger animals,*** **5 to 10 mg. per pound of body weight, administered once per day.**

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New high potency treatment for ketosis...

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Highly purified corticotropin (ACTH) in Prolacthyl HP Veterinary produces greater adrenocortical stimulation unit for unit than older forms of corticotropin—with rapid reversal of ketosis symptoms. Most cases respond to a single dose of 5.0 cc. to 10 cc. (equivalent to 300 U.S.P. units to 600 U.S.P. units).

Blood sugar levels are usually raised to normal limits within 24 hours; increased milk production may generally be expected within 3 days. Supplied in vials of 10 cc.

PROLACTHYL is a Squibb trade-mark

a high effective treatment for mastitis...

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Each 5-gram disposable syringe contains 200,000 units of potassium penicillin and 200 mg. of dihydrostreptomycin, formulated in the thorough-penetrating Squibb Base – plasticized hydrocarbon gel.

These two antibiotics have an extremely broad anti-bacterial spectrum, and the Squibb Base assures thorough distribution of the antibiotics through the glandular tissue. Distrycillin is supplied in easy-to-use disposable plastic syringes, and is available in boxes of twelve.

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for topical ophthalmic anesthesia...

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All these and other Squibb veterinary products are available from your veterinary supply house. For further information, address: SQUIBB, *Veterinary Department*, 745 Fifth Avenue, New York 22, N. Y.

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for

treatment of

BLUE COMB DISEASE *in*

chickens

turkeys

BLUCO TABLETS

EACH TABLET CONTAINS:

Partially refined Sugar	40 gr.
Potassium Muriate	8 gr.
Iron Phosphate	½ gr.
Cobalt Sulfate	⅛ gr.
Copper Sulfate	¼ gr.

PACKAGED IN:

1/100	.75
12/100	8.55
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directions:

Dissolve 2 BLUCO tablets in each gallon of drinking water, and allow no other water. Continue treatment 7 days for complete recovery; otherwise, disease may re-occur. Precede treatment with flush (about 6 hours, preferably in the morning).

One gallon of medicated drinking water treats about 20 adult chickens, turkeys in proportion.

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East Bay (Calif.) Veterinary Medical Association, bimonthly, the fourth Wednesday. John T. Turver, 1201 E. 12th St., Oakland 6, Calif., secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. R. P. Link, College of Veterinary Medicine, University of Illinois, Urbana, Ill., secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month. John D. Baker, Goldsboro, N. Car., secretary.

Fayette County Veterinary Association, Iowa, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Greater St. Louis (Mo.) Veterinary Medical Association, the first Friday of the month (except July and August) at the Sheraton Hotel, Spring Ave. and Lindell Blvd. Luther E. Fredrickson, Room 25, Municipal Courts Bldg., St. Louis, Mo., secretary.

Jacksonville (Fla.) Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. L. D. Barrett, Rt. 8, Box 572, Jacksonville, Fla., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month in Louisville or within a radius of 50 miles. Dr. W. E. Bewley, P.O. Box "H", Crestwood, Ky., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at alternating hospitals. W. F. Noland, 7504 Metcalf, Overland Park, Kan., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month at Exchange Hall, ninth floor, Livestock Exchange Bldg., 1600 Genessee St., Kansas City, Mo. Busch Meredith, 800 Woodswether Rd., Kansas City 5, Mo., secretary.

Kern County (Calif.) Veterinary Medical Association, the first Thursday evening of each month. B. C. Watson, 825 14th St., Bakersfield, Calif., secretary.

Keystone (Pa.) Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine, 39th and Woodland Ave., Philadelphia 4, Pa. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St. W., Huntington, W. Va.

(*Continued on p. 32*)

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Another accurate smooth working ground glass barrel — leak proof metal plunger instrument with many possibilities. Adjustable for any capacity. By attaching one end of a rubber tube to the self-filling syringe and the other to a bottle of serum or vaccine any number of quick 1/4cc to 5cc accurate dose injections can be made. The instrument is operated with one hand. Anyone who injects a large number of animals will find the Self-Filling Syringe will pay for itself both in labor and serum saved after the first day's use.

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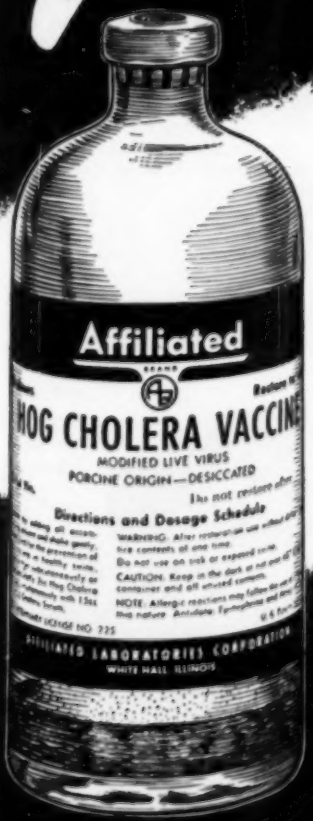

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(COMING MEETINGS—*continued from p. 30*)

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April at the Academy of Medicine, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Millburn Ave., Maplewood, N. J., secretary.

Michiana Veterinary Medical Association, the second Thursday of each month, at the Hotel LaSalle, South Bend, Ind. L. D. Ramsay, 719 E. Jefferson Ave., La Porte, Ind., secretary.

Michigan, Southeastern Veterinary Medical Association, the second Thursday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Road, Detroit 5, Mich., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. George McCollister, 2146 Broad St., San Luis Obispo, Calif., secretary.

Mid-State (Mich.) Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. George F. Lynch, 201 West Devon St., Milwaukee 17, Wis., secretary.

Monterey Bay Area (Calif.) Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campell, 90 Corral de Tierra, Salinas, Calif., secretary.

New Castle County (Del.) Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. Arthur P. Coogan, 2102 New Road, Wilmington 5, Del., secretary.

New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northern Colorado Veterinary Medical Society, the second Monday of each month. William H. Beckenhauer, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Casa Mana in Teanek, N. J. Edward Baker, 568 Grand Ave., Englewood, N. J., secretary.

(*Continued on p. 54*)

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The rigid standards embodied in Grain Belt products have been applied to a new line . . . Affiliated. These products, too, are of that high quality you have come to expect from Grain Belt. Our reputation, gained through 35 years of continuous service, is fully behind the entire Affiliated line. We invite you to use these products in full confidence. ● The Grain Belt Supply Company, which has served you faithfully for many years, is proud to take part in bringing you the new Affiliated line.

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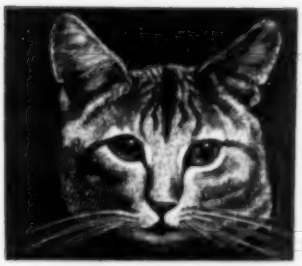
Upjohn
DEPARTMENT OF VETERINARY MEDICINE, KALAMAZOO, MICHIGAN



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AVAILABLE IN ONE-QUARTER POUND JARS

(COMING MEETINGS—*continued from p. 32*)

Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. Ernest Makino, Patterson, Calif., secretary.

Oklahoma County Veterinary Medical Association, the second Wednesday of every month except July and August. Carl L. Clark, 127 N. W. 23rd St., Oklahoma City, Okla., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month at 8:00 p.m. in Antlers Hotel, San Bernardino, Calif. Jay C. Wallis, 112 N. Girard St., Hemet, Calif., secretary.

Orange County (Calif.) Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643 N. Main St., Santa Ana, Calif., secretary.

Peninsula (Calif.) Veterinary Medical Association, the third Monday of each month. T. D. Harris, San Mateo, Calif., secretary.

Piedmont (N. Car.) Veterinary Medical Association, the last Friday of each month at 7:00 p.m. in Mull's Motel in Hickory, N. Car. W. W. Dickson, Box 1071, Gastonia, N. Car., secretary.

Piedmont (S. Car.) Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union, S. Car. Worth Lanier, York, S. Car., secretary.

Pima County (Ariz.) Veterinary Medical Association, the third Wednesday of each month in Tucson. E. T. Anderson, 8420 Tanque Verde Rd., Tucson, Ariz., secretary.

Redwood Empire (Calif.) Veterinary Medical Association, the third Thursday of each month. Robert E. Clark, Napa, Calif., secretary.

Sacramento Valley (Calif.) Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freeport Blvd., Sacramento, Calif., secretary.

Saginaw Valley (Mich.) Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month except July and August. E. R. Quortrup, 4005 Rosecrans St., Building 2, San Diego, Calif., secretary.

San Fernando Valley (Calif.) Veterinary Medical Association, the second Friday of each month at Eaton's Restaurant in Studio City, Calif. R. A. Button, 5954 Van Nuys Blvd., Van Nuys, Calif., secretary.

Seattle Veterinary Medical Association, the third Tuesday of each month in the Trinity Episcopal Church, 8th and James St., Seattle, Wash. P. R., Des Rosiers, 5508 2nd Ave. N. W., Seattle 7, Wash., secretary.

Southeastern (Mich.) Veterinary Medical Asso-

(*Continued on p. 36*)

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The Complete Lipotropic Diet Supplement for Dogs

- Restores healthiy hair and skin
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Hamilton, N. Y.

(COMING MEETINGS—*continued from p. 34*)

ciation, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 5, Mich., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2, Box 697, Tucson, Ariz., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. Howard C. Taylor, 2811 West Olive St., Burbank, Calif., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. E. D. Stoddard, 6432 S. W. 8th St., Miami, Fla., secretary.

South Puget Sound (Wash.) Veterinary Medical Association, the second Thursday of each month except July and August. Jo Walker, Agriculture Experiment Station, Puyallup, Wash., secretary.

Tenth District (Ind.) Veterinary Medical Association the third Thursday of each month. W. E. Sharp, Union City, Ind., secretary.

Tulsa (Okla.) Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Merle S. Watts, 5302 E. 11th St., Tulsa, Okla., secretary.

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BRAND OF OXYTETRACYCLINE
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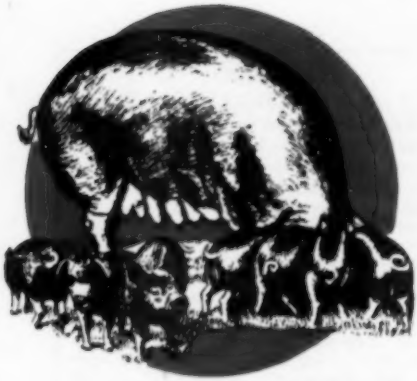

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Modified Live Virus
Vacuum Dried
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Compare PRICE

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MASTICS P&S

100,000 units penicillin
50,000 mcg. dihydrostreptomycin

MASTICS act fast because medication in high concentration is quickly dispersed throughout the quarter. Improvement often noted in 12 hours.

MASTICS contain no grease, no wax, no insoluble materials to remain in the udder retarding antibiotic action. MASTICS milk out completely—produce no residue on the strainer.

MASTICS are so effective, cows are returned to the herd more promptly with less loss of production.

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Veterinarian wanted with Missouri license for exclusive small animal practice. Salary, first year; percentage afterwards. Give all details in first letter. Address "Box R 5," c/o JOURNAL of the AVMA.

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Young veterinarian wanted for modern small animal hospital in eastern metropolitan suburb. Some experience helpful. Salary, terms, future open; details required in first letter. Address "Box S 4," c/o JOURNAL of the AVMA.

(Continued on p. 40)

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keratitis (pink-eye) and other external infections which respond to sulfonamide and tyrothricin medication.

Useful in otitis externa (ear canker) in dogs

Sulfanilamide 32%, Sulfathiazole 16%, Phenacaine 1%, Methylene blue 0.5%, Tyrothricin 0.05%, Boric acid.

Finely powdered, will not clog nozzle of new style, round, durable plastic puffer bottle.

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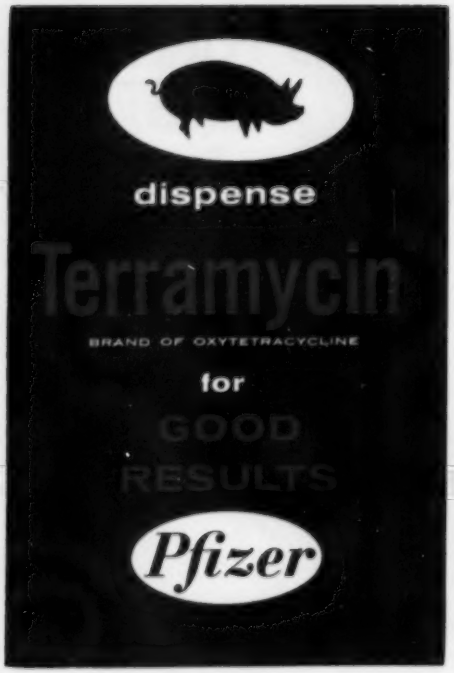

(CLASSIFIED ADS—*continued from p. 38*)

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Assistant wanted; single, man or woman veterinarian. Must be licensed in Georgia, or have license in state reciprocal with Georgia, or able to pass Georgia State Board this autumn. Predominantly small animals. Offers $75 a week; comfortable bachelor-type quarters furnished in hospital. No partnership but salary increases the longer you stay. Ample time off for ocean bathing. Address Glynn County Veterinary Hospital, 1217 Grant St., Brunswick, Ga.

(*Continued on p. 42*)

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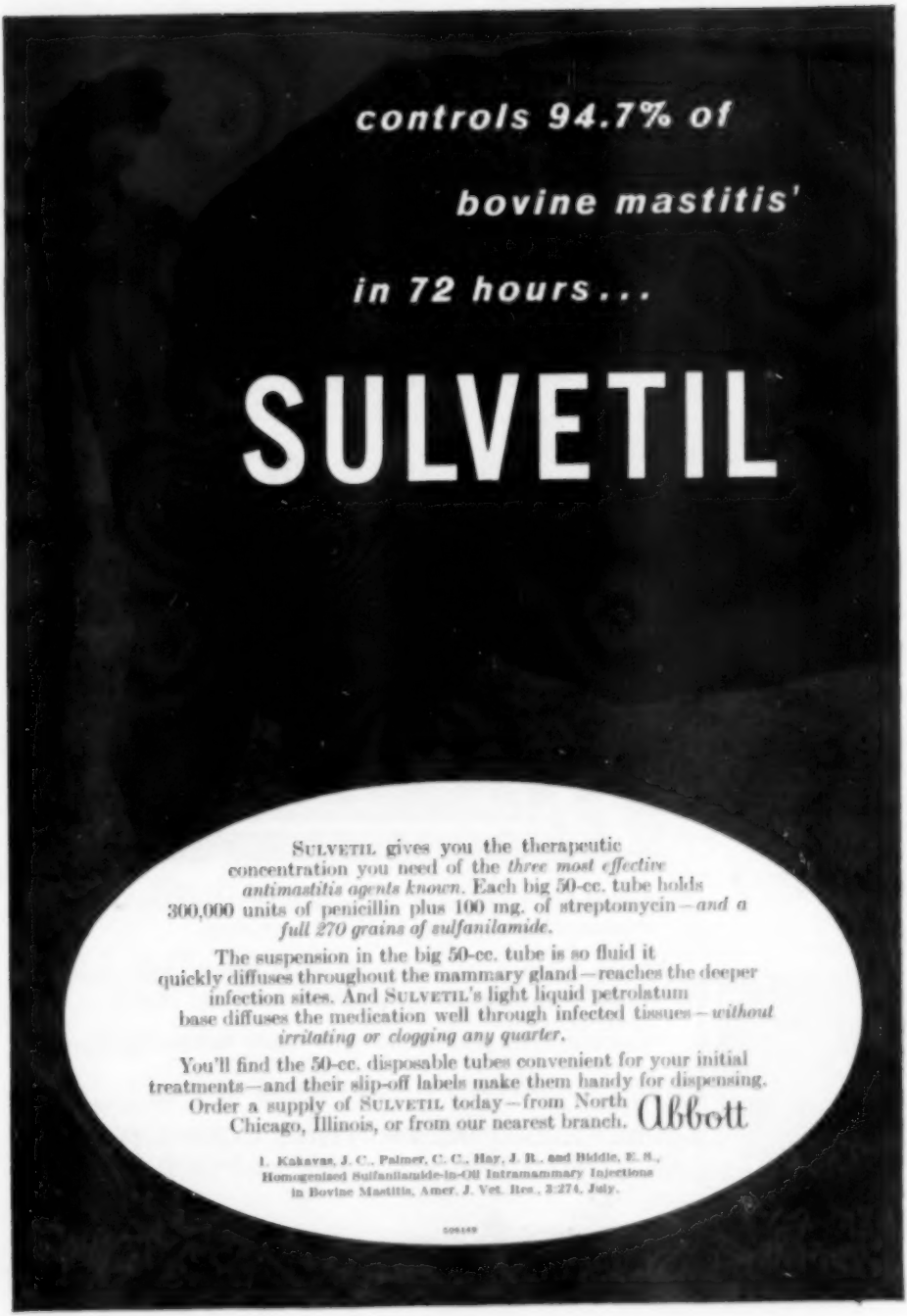
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bovine mastitis'
in 72 hours...
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SULVETIL gives you the therapeutic concentration you need of the *three most effective antimastitis agents known*. Each big 50-cc. tube holds 300,000 units of penicillin plus 100 mg. of streptomycin—*and a full 270 grains of sulfanilamide.*
The suspension in the big 50-cc. tube is so fluid it quickly diffuses throughout the mammary gland—reaches the deeper infection sites. And SULVETIL's light liquid petrolatum base diffuses the medication well through infected tissues—*without irritating or clogging any quarter.*
You'll find the 50-cc. disposable tubes convenient for your initial treatments—and their slip-off labels make them handy for dispensing. Order a supply of SULVETIL today—from North Chicago, Illinois, or from our nearest branch. Abbott
1. Kakavas, J. C., Palmer, C. C., Hay, J. R., and Biddle, E. S., Homogenized Sulfanilamide-in-Oil Intramammary Injections in Bovine Mastitis, Amer. J. Vet. Res., 3:274, July.
506149

Laboratory Service for Veterinarians

These laboratories have been established to aid veterinarians in the diagnosis of obscure as well as common ailments in large and small animals. The chief aim of our staff is to give quick and accurate diagnosis at all times.

Our service includes fecal examinations, anti-biotic sensitivity tests, urinalyses, blood counts, tissue sections, bacteriological cultures, cultures for ringworm and blood chemistry. It is designed to assist owners and breeders of stock of all kinds including dogs, cats, horses, cattle, poultry, hogs and sheep.

Sample containers and price list on request.

VETERINARY DIAGNOSTIC LABORATORIES

220 East 23rd St., New York 10, N.Y.

(CLASSIFIED ADS—*continued from p. 40*)

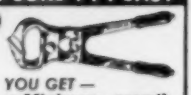
Veterinarian wanted for research work on large animal diseases; some postgraduate experience in bacteriology and pathology desirable; ability to work with ranchers essential. Attractive salary and retirement plan. Address Department of Veterinary Science, University of Nevada, Reno, Nevada.

Veterinarian wanted to associate with progressive practitioner in large northern Virginia community. Modern small animal hospital; growth necessitates additional veterinary assistance. Year's trial at substantial salary and numerous periodic vacations. Partnership after one year if mutually desired. No monetary investment. Address "Box S 16," c/o JOURNAL of the AVMA.

(*Continued on p. 50*)

CASTRATION
SAFE . . . SURE . . . EASY

***USE* BURDIZZO**
BLOODLESS CASTRATOR
USED SUCCESSFULLY OVER 30 YEARS.



YOU GET —
- **Minimum growth set back**
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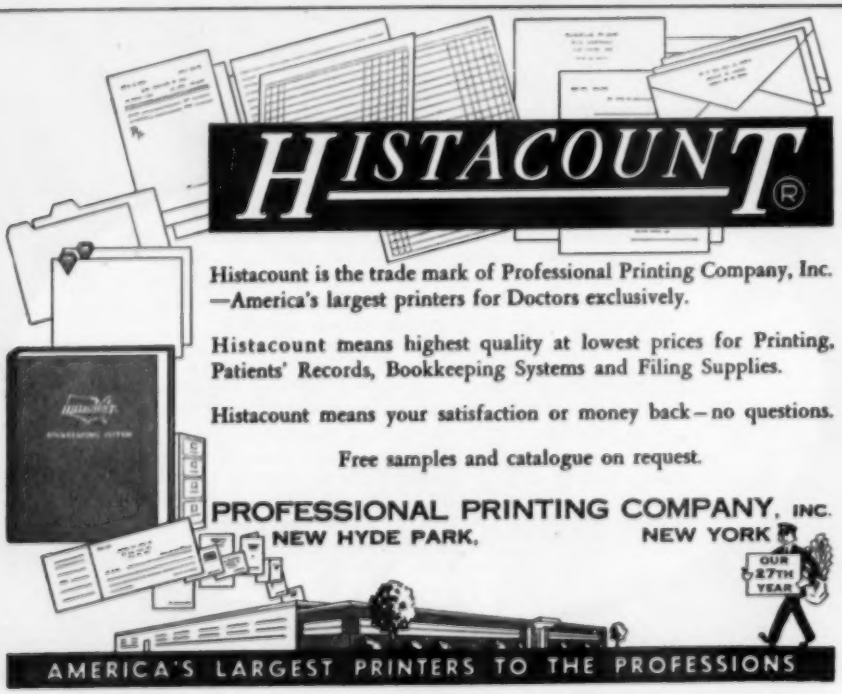
Ask your dealer for the original bloodless castrator made by La "Burdizzo" Co., Turin, Italy

BE SURE IT'S STAMPED WITH THE WORD **BURDIZZO**



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SWIFT'S DOG MEAL
IT'S CONDENSED!
FEED UP TO 25% LESS!
New Pard Meal is so rich in concentrated food value that, pail for pail, you feed less... up to 25% less than with other dry-type foods. Ask your Swift salesman to show you a comparative feeding chart.
It's meatier... and far tastier
BECAUSE
MEAT MEN
MAKE IT!

Swift's

PARD MEAL

also has more meat fat than any other leading dry-type food!

In making Pard Meal, we've not only included every known element needed in canine nutrition, but also added *extra* amounts of meat fat, up to 50% more than you'll find in other dry-type foods. Dogs love it! And Pard Meal is so concentrated in complete food values you can actually feed up to 25% *less* by volume.

Order it in 25 or 50-lb. bags.

Like Pard Meal, Swift's canned PARD is the result of years of research in Swift's laboratories and kennels. It completely eliminates the "guesswork" from the science of animal feeding. Pard is all a dog needs or wants, with GOOD BEEF TASTE dogs love!

SWIFT & COMPANY

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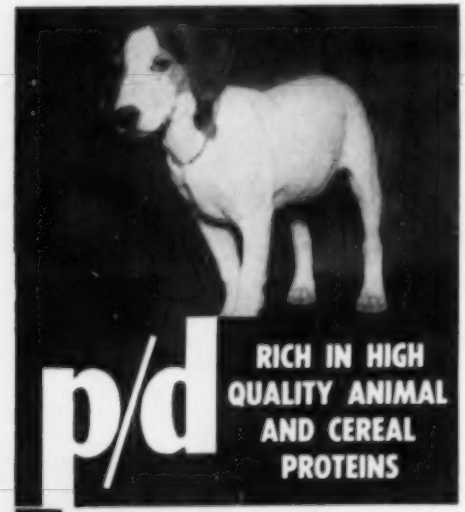
Swift



DIAGNOSIS

A three months old pup for distemper vaccination. Fecal examination—hookworm (3 plus), red blood cell count 3,000,000. Dog is underweight and growth is retarded.

TREATMENT

Administer serum, prescribe p/d 50 calories per body pound daily, treat for intestinal parasites one week later and proceed with immunization when patient is in satisfactory condition.

SCIENTIFIC BASIS FOR PROCEDURE

Antibodies are developed from amino acids made available from high quality dietary protein.

(Inquiry form for graduate veterinarians only)
HILL PACKING COMPANY, Box 148, Topeka, Kan.
Send information on therapeutic feeding ☐
Send information on other Hill products ☐
NAME.....
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CITY AND STATE.....

HILL PACKING COMPANY
P.O. Box 148 Topeka, Kan.

Correspondence

June 2, 1955

Dear Dr. Hardenbergh:

During the past year I have been engaged in graduate work in veterinary pathology at The Ohio State University. This study was made possible by an AVMA Research Council Fellowship and afforded the undersigned an opportunity to obtain a master of science degree from the Veterinary Pathology Department.

In accordance with instructions received from Dr. R. Getty, secretary, AVMA Research Council, I am enclosing an unbound copy of a thesis which was completed in the year of study made possible by the AVMA fellowship.

I would like to express my appreciation to the American Veterinary Medical Association for the aid which has made it possible for me to secure graduate training in veterinary pathology.

Sincerely yours,
s/Charles F. Simpson,
Columbus, Ohio.

• • •

In the "Correspondence" columns of the August, 1954, issue (adv. p. 48), a letter from a 15-year-old school boy in Kenya, British East Africa, was published in which he set forth his desire to come to this country to study veterinary medicine. The boy was advised to seek assistance from the British schools and also to undertake preparatory training. The following letter tells of his progress:

June 17, 1955

Dr. J. G. Hardenbergh,
Executive Secretary,
American Veterinary Medical Assoc.,
Chicago 5, Illinois,
U. S. A.

Dear Dr. Hardenbergh:

I am referring to your letter to me of the 21st of June, 1954. It is already almost a year since you wrote it.

When I read it, I fully understood and made my plans to follow your advice.

I applied to three of the schools in British Isles whose addresses you sent me and none of them seemed to be of assistance to me.

After that, I made an application to a school in India for preparatory education as you told me. I am now accepted plus free tuition and dormitory fees. I am therefore hoping to leave this troubled Kenya of ours sometime in July.

Therefore, my lord, since this preparatory education in India will take me only two years, I am still looking forward to apply to you again for financial assistance to one of the veterinary colleges in the U.S.A. By that time I will be a bigger boy with a wider knowledge.

Our country, Kenya, is deteriorating in situation. The war is terrifying. My poor father was killed recently by terrorist gangs in his house. I

(Continued on p. 46)

New dispensing size for greater convenience and profit!

TERRAMIX*-5

Gm. of oxytetracycline hydrochloride (Terramycin®) activity per lb.

TERRAMIX*-10

Gm. of oxytetracycline hydrochloride (Terramycin®) activity per lb.

these popular and effective
Terramycin*† feed supplements
are now available
in 5-pound canisters

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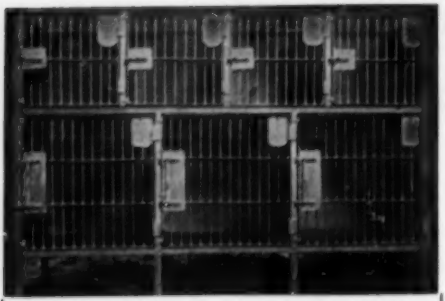
STURDY, RE-USABLE CONTAINER
GOOD PROFIT MARGIN

*TRADEMARK
†BRAND OF OXYTETRACYCLINE

Department of Veterinary Medicine **Pfizer** PFIZER LABORATORIES, Brooklyn 6, N. Y.
Division, Chas. Pfizer & Co., Inc.



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MANUFACTURED IN 5, 7, AND 8, CAGE UNITS. EQUIPPED WITH BALLBEARING CASTERS AT NO EXTRA COST. MINOR CHANGES IN DESIGN OPTIONAL. SLIDING PANELS BETWEEN CAGES IF DESIRED. STEEL-BARRED DOORS AND ESCAPE-PROOF LATCHES. NEW TYPE DOOR FRAMES WILL NOT COLLECT DIRT. VENTILATING STRIP IN LOWER CAGES. GALVANIZED STEEL USED.

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Gallon	Quart
$13.95	$4.00
Makes 4 gallons	Makes a gallon

Available nationally through well known Distributors

Write for free sample

Osco Chemical Company, Inc.
1843 Cheshire Bridge Road, N.E.
Atlanta 1, Georgia

(CORRESPONDENCE—*continued from p. 44*)

don't keep this in mind. I am only looking forward to see that I attain the necessary education for my future life and for my people and Kenya's benefit.

I can tell you another time before I leave Kenya about what is happening in it. I also hope to read from newspapers or hear over a radio. We don't hope of the regulations to come to our aid soon. More than one million Kikuyus (the natives) have been detained and more than half million are murdered.

But God is planning, I am sure, to do what he wants. I am sure you will entertain my letter to you. I also hope to hear from you before I leave this country. I remain to be, my lord, your most obedient boy,

(The boy's name is withheld for the time being. However, if anyone is interested in helping him, his name and address will be furnished.—ED.)

• • •

More Letters of Appreciation

My gold Life Membership card is much appreciated and I am very proud of it. . . I attended my first AVMA meeting in New York in 1913 and missed very few since, until my retirement in 1952. I have fought many battles in the interest of organized veterinary medicine, and it is a great pleasure for me to observe the present standing, efficiency, and general prestige of our national association.

s/H. D. Bergman,
Iowa State College,
Ames, Iowa.

• • •

I appreciate the action of the Association. You may be assured of my continued interest and any support I may give to AVMA activities.

s/Chas. Thompson Fake,
Schuylerville, N. Y.

• • •

This is to gratefully acknowledge my designation as a Life Member. I am still in active practice and hope to continue as long as able.

s/Charles E. Palmer,
Shelbyville, Ky.

• • •

Again the AVMA has brought me pleasure. I always have been proud to be a member and feel doubly proud to be a Life Member. The gold card you sent is one of my treasured possessions.

s/Stanley Smith,
University of Missouri,
Columbia, Mo.

• • •

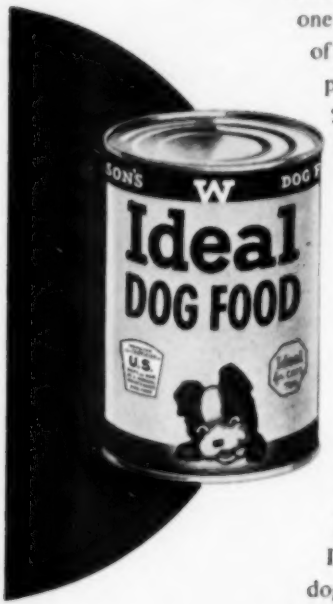
Many thanks for my Life Membership card. I served on the Wisconsin Board of Veterinary Examiners for 20 years but resigned two years ago due to a heart condition, which has greatly improved.

s/C. F. Van de Sand,
Kiel, Wis.

Ideal Dog Food *and the "Lipotropic Effect"*

Recent findings in Wilson & Co.'s continuing laboratory research into canine nutrition have established two important facts:

1. Ideal Dog Food is richer in biologically complete, high-quality protein. Only this type of protein produces the "lipotropic effect"—the tendency to metabolize essential fats into well-distributed, usable calories. (Incomplete protein, or that lacking in one or more amino acids, tends to cause "depot deposits" of fats in the liver and other organs—spotty distribution that provides absolutely no benefit to the dog.)



2. Only Ideal Dog Food is enriched with the vitagen "arachidonic acid"—the essential factor in curbing eczema, itching, and other skin disorders . . . and vital to the desirable development of skin appendages such as the hair and nails.

You, as a veterinarian, understand the importance of proper nutrition to the healthy development and well-being of dogs. Wilson & Co., meat packer, makers of Ideal, are stressing the need for *complete* tissue nourishment in their current advertising to dog owners.

Your Clients Will Want To Know These Facts

As your technical experience has demonstrated to you, many dog foods do not provide complete nutrition. Ideal is guaranteed to supply the seven nutritional elements dogs are known to need—calories, carbohydrates, fats, proteins, minerals, vitamins, and the accessory factors. The protein provided by Ideal is perfectly balanced to include all eight of the essential amino acids—recognized as the "building blocks" of the body.

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Remember—your professional reputation rests on the health of your patients. Protect it with Ideal Dog Food . . . pioneer in canine nutrition for over twenty-five years.

Ideal DOG FOOD made by Wilson & Co. MEAT PACKERS

POLYOTIC*

Lederle Professional Line

POLYOTIC* INTRAMUSCULAR:
100 mg.-500 mg.-1.0 Gm.-5.0 Gm.

POLYOTIC INTRAVENOUS:
100 mg.-2.5 Gm.

POLYOTIC OBLETS®: 4's-6 x 4's

POLYOTIC CAPSULES: 50 mg., 25's-100's;
100 mg., 100's; 250 mg., 16's-100's

POLYOTIC TABLETS: 50 mg., 25's-100's;
100 mg., 25's-100's; 250 mg., 16's-100's

POLYOTIC MASTITIS OINTMENT: ¼ oz.

POLYOTIC COMPOUND MASTITIS OINTMENT: ¼ oz.

POLYOTIC OPHTHALMIC OINTMENT 1%:
6 x ⅛ oz.

POLYOTIC TOPICAL OINTMENT 3%: 1 oz.

POLYOTIC SOLUBLE (Tinted) POWDER:
¼ lb.-½ lb.-1 lb.-5 lb.

AVIANIZED® RABIES VACCINE (Canine):
1 dose-5 x 1 dose-10 doses

AVIANIZED RABIES VACCINE (Cattle): 10 doses

AVIANIZED CANINE DISTEMPER VACCINE:
1 dose-10 x 1 dose

ANTI-CANINE DISTEMPER SERUM AND ANTI-INFECTIOUS CANINE HEPATITIS SERUM: 20 cc. 100 cc.

INFECTIOUS CANINE HEPATITIS VACCINE: 2 cc.-10 cc.

BRUCELLA ABORTUS VACCINE: 1 dose-5 x 1 dose-5 doses (25 cc.)

FELINE DISTEMPER VACCINE: 1 immunization (2 vials Vaccine, 2 vials Sterile Diluent, 2 cc.)

ANTI-FELINE DISTEMPER SERUM: 50 cc.

CARICIDE® Diethylcarbamazine TABLETS:
400 mg., 25's

DIETHYLSTILBESTROL SOLUTION: 10 cc.-50 cc.

LEPTOSPIRA CANICOLA-ICTEROHEMORRHAGIAE BACTERIN
Whole Culture Inactivated Vacuum-Dried.

Other products to be added.

*Trade-Mark

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LEDERLE LABORATORIES DIVISION

Pearl River AMERICAN Cyanamid COMPANY New York

Tetracycline

Here is the newest of the broad-spectrum antibiotics, clinically proved and ready for intravenous, intramuscular, intrauterine, intravaginal, intramammary, conjunctival, aural and topical use.
No other antibiotic is available to the profession only in such a wide variety of dosage forms. No matter what route of administration, there is a POLYOTIC designed for proper professional application and for dispensing. *Available to Licensed Veterinarians Only.*

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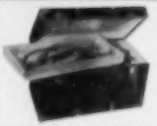
precision veterinary equipment



durable, metal sheathed instrument/serum cases

Baked black enamel over steel with brass trim. 5 standard models; light weight, yet built to take knocks! See folder N-1 for sizes, prices.

new do-it-yourself Plasti-Plated cages

Before you buy cages, write for folder N-2 on our amazing new Plasti-Plated kennels. Rock-hard, glass-smooth, seamless surfaces. Inexpensive, easy to do-it-yourself!

electric "B" dairy cow branding iron

Heats in 90 seconds, makes a clean brand, weighs only 11 ounces. T and V brands available too. Uses 110 v. current, won't smoke. Write for folder N-3.

new cable-less swine OB forceps

Rigid, all metal OB snare developed by an Iowa practitioner. Handles pelvic "nosedivers" easily. Write for folder N-4.

new electric range branding iron

For your clients: all-electric range brand that eliminates fire hazard. Makes branding an assembly-line operation. Write for folder N-5.

hi-current electric firing iron

Most modern, up-to-date way to fire horses, remove warty growths, ear polypi, tumors. Complete with 11 points/tips. Write for folder N-6.

☐ folder N-1 cases ☐ folder N-2 Plasti-Plate ☐ folder N-3 "B" irons

☐ folder N-4 OB forceps ☐ folder N-5 range brand ☐ folder N-6 firing irons

Please send me the folders I've checked above.

DVM

street

city

Nicholson Manufacturing, Inc.
2440 East Third Avenue Denver 6

clip and mail today

(CLASSIFIED ADS—*continued from p. 42*)

Veterinarian wanted, man or woman, to assist in small animal practice; excellent salary, no evening hours. Address Dr. James Patterson, 3800 Grand River Ave., Detroit, Mich.

Young graduate assistant veterinarian wanted for exclusive small animal practice. Arizona license required later. Address "Box S 5," c/o JOURNAL of the AVMA.

Veterinarian wanted to assist in small animal practice; position leading to partnership. Virginia license required. Address "Box S 10," c/o JOURNAL of the AVMA.

Veterinarian wanted, married man preferably, to assist in small animal practice; excellent salary. Address Dr. Robert J. Cyrog, Skokie Animal Hospital, Skokie, Ill.

Experienced veterinarian wanted as associate in busy small animal hospital. Address Stresser Animal Hospital, 5144 W. Grand Ave., Chicago 39, Ill.

Immediate openings for 2 veterinarians in diagnostic laboratories in State of Arkansas; primarily poultry diagnosis nd vaccine production. Salary $6,000 per year. Please send complete details in first leter to P.O. Box 2821, Little Rock, Arkansas.

Wanted veterinarian; to the right man will pay 50% of net earnings of a general practice. Permanent; Connecticut license required. Send complete personal details. Address "Box S 8," c/o JOURNAL of the AVMA.

Veterinarian wanted to assist in modern well-equipped small animal hospital; salary and bonus. Answer full detail; list state licenses held. Address "Box S 17," c/o JOURNAL of the AVMA.

Wanted—Positions

German veterinarian, 29, single, seeks position as assistant in small animal or mixed animal clinic; good experience. State Board examination and Doctorate diploma of the Veterinary School of the University of Munich, Germany, July, 1954 (graduates of this year are recommended by AVMA for recognition by State Boards and other agencies). Speaks fluent English; sponsorship for emigration must be granted by employer. Address Dr. Guenter Alberti, 25 Zuccalistreet, Munich 38, West Germany.

Veterinarian wanted to assist in general practice—70 per cent small animal, 30 per cent large. Good future possibility. Address "Box S 18," c/o JOURNAL of the AVMA.

Veterinarian desires assistantship in progressive small animal hospital. Draft-exempt; married, age 32. Salary secondary; licensed in Ohio, Delaware. Address "Box S 9," c/o JOURNAL of the AVMA.

Qualified woman veterinarian, several years of small animal experience, licensed California, desires association with progressive small animal hospital. Will consider lease, partnership, or purchase. Address "Box S 12," c/o JOURNAL of the AVMA.

For Sale or Lease—Practices

For sale, 1½ acres in Middlewest on heavily traveled main highway; ideal location for veterinarian. Adjoins finest boarding kennel in the country. Address "Box S 1," c/o JOURNAL of the AVMA.

Practice for sale for inventory value of drugs and

(*Continued on p. 52*)

when an

INACTIVATED VIRUS

is your choice!

HEPOID

INFECTIOUS CANINE HEPATITIS VACCINE

BIOID

CANINE DISTEMPER VACCINE AND INFECTIOUS CANINE HEPATITIS VACCINE

Indicated

When a durable immunity against Infectious Canine Hepatitis is desired.

Indicated

When a durable immunity against EITHER or BOTH Canine Distemper and Infectious Hepatitis is desired.

- Sold only to Qualified Graduate Veterinarians.
- Supplied in Single Vial, 3 Single Vial, or 10 Single Vial Packages.

CONTACT YOUR LOCAL DISTRIBUTOR

Fromm Laboratories Inc.

Grafton, Wisconsin, U. S. A.

dispense

Terramycin®

BRAND OF OXYTETRACYCLINE

for

ADDED INCOME

Pfizer

(CLASSIFIED ADS—*continued from p. 50*)

instruments only; in northern Iowa town of 1,700. Complete laboratory facilities, two-way radio, cattle chute, kennels, etc. Combination home and hospital can be rented. Practice grosses over $36,000. Address "Box S 2," c/o JOURNAL of the AVMA.

Large animal practice for sale in Middlewest; owner can not continue with practice due to accident. Price based on appraised value of drugs and equipment. Address "Box S 3," c/o JOURNAL of the AVMA.

Veterinary practice for sale, established 35 years; main artery real estate including 7-room modern home, 30 kennels, equipment, and medical supplies. Owner, moving out of territory, wants action. Thriving area offers unlimited opportunity for growth. Cash needed, $15,000; balance on good terms. Write or phone Harold W. O'Connor, Realtor, 435 Albany Ave., Kingston, N.Y. Phone 5759.

Dog and cat hospital and house for sale in New Jersey. Address "Box S 7," c/o JOURNAL of the AVMA.

(*Continued on p. 56*)

Send for FREE 36-page Treatise on

CARROT OIL VITAMINS

Details the advantages of carrot oil vitamins when used in feeds to improve breeding results; to destroy oxidized milk flavors; and to promote general good health and glossy coats. Contains much information. Replete with data and references. Send for it today

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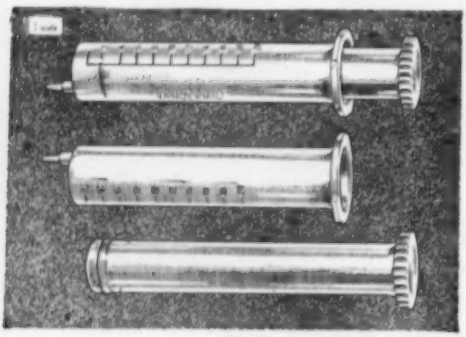

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"ANALGIC" Hypodermic Needles.

Two names that are a MUST in the economy of a veterinary practice.

A syringe that is unbreakable, with 200 boiling hours. A needle that gives up to 400 insertions with a point that is completely revolutionary in design.

"ANALGIC" is the name with a future.

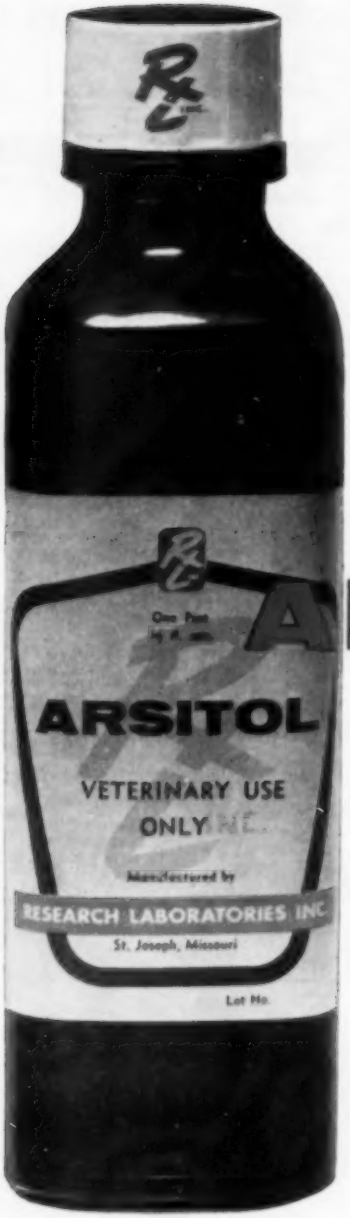
Entirely new in concept and design. Virtually painless to the patient. Diminished predictable trauma. Smooth insertin. Prolonged effective life. Normal prices.

A complete instrument service to the Veterinarian.

Leaflets and catalogues available to graduate veterinarians.

ARNOLD & SONS
Veterinary Instruments Limited,
183, Woolwich Street,
Guelph, Ontario

Established in the U.K. 1793.



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Swine Enteritis

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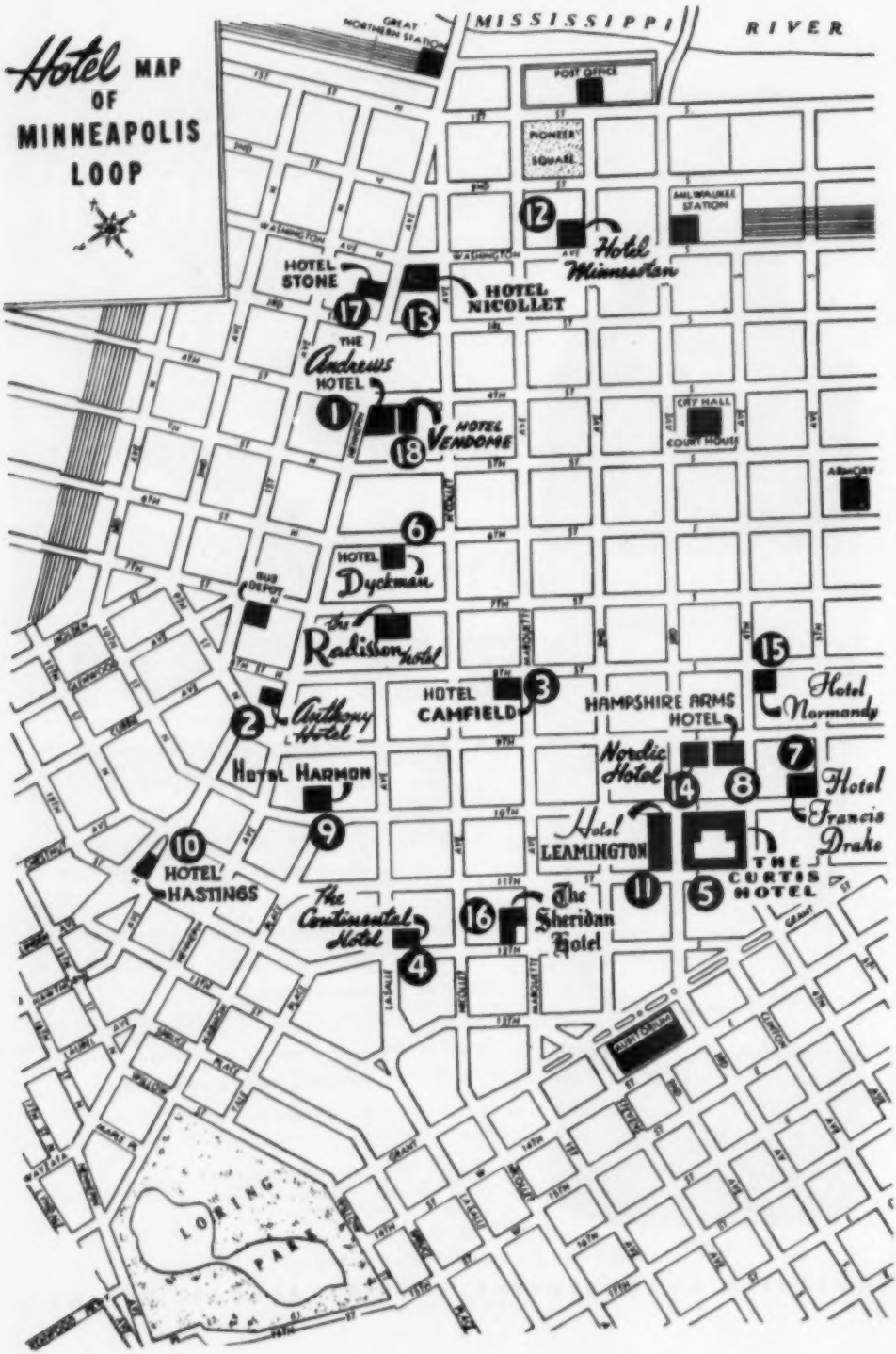
Research Laboratories

ARSITOL*

- **ARSITOL** stimulates appetite, increases gain, gets pigs back on feed quickly.
- **ARSITOL** is recommended by leading swine practitioners.
- **ARSITOL** provides two way results—from Sodium Arsanilate and B Complex vitamins.
- **ARSITOL** is *practical for dispensing*—easily administered in drinking water by the farmer.

Available from Independent Ethical Distributors selling to graduate Veterinarian's only.

Research Laboratories, Inc., St. Joseph, Missouri


Hotel MAP OF MINNEAPOLIS LOOP
MISSISSIPPI RIVER
GREAT NORTHERN STATION
POST OFFICE
PIONEER SQUARE
MILWAUKEE STATION
Hotel Minneapolis
HOTEL STONE
HOTEL NICOLLET
THE Andrews HOTEL
HOTEL VENDOME
CITY HALL COURT HOUSE
ARMORY
HOTEL Dyckman
MILL DEPOT
The Radisson hotel
Anthony Hotel
HOTEL CAMFIELD
HAMPSHIRE ARMS HOTEL
Hotel Normandy
Nordic Hotel
Hotel Francis Drake
HOTEL HARMON
Hotel LEAMINGTON
THE CURTIS HOTEL
HOTEL HASTINGS
The Continental Hotel
The Sheridan Hotel
LORING PARK
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HOTEL RESERVATIONS — MINNEAPOLIS CONVENTION

Ninety-Second Annual AVMA Meeting, Aug. 15-18, 1955

All requests for hotel accommodations will be handled by a Housing Bureau in cooperation with the Committee on Local Arrangements. The Bureau will clear all requests and confirm reservations.

HOTELS AND RATES

HOTEL	SINGLE	DOUBLE	TWIN BEDS
1. Andrews	$4.00-6.50	$5.75-9.50	$7.00-10.00
2. Anthony	$3.25-4.50	$4.50-6.50	$6.00-8.00
3. Camfield	$3.50-5.00	$4.50-6.00	$6.00-8.00
4. Continental	$4.00	$5.00	$6.00
5. Curtis	$5.00-6.50	$6.50-8.00	$8.50-11.00
6. Dyckman	$4.00-7.50	$7.00-11.50	$8.00-12.50
7. Francis Drake	$5.00-8.00	$6.50-9.00	$8.50-10.50
8. Hampshire Arms	$3.50-4.50	$5.00-6.00	$6.00-7.50
9. Harmon	$3.50	$4.50	$6.00
10. Hastings	$3.50-5.00	$6.00-7.00	$8.00
11. Leamington	$6.00-12.00	$8.00-14.00	$9.50-16.00
12. Minnesotan	$3.50-5.25	$5.00-7.00	$7.00-8.00
13. Nicollet	$5.50-10.50	$8.50-14.00	$9.00-14.00
14. Nordic	$4.00	$5.00-6.00	$7.00
15. Normandy	$5.00-7.00	$7.50-8.00	$9.00-10.00
16. Sheridan	$4.50-5.50	$6.00-7.00	$8.00
17. Stone	$3.25	$5.00	$6.00
18. Vendome	$3.00-4.00	$4.50-5.50	$5.50-6.00

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To: HOUSING BUREAU

Minneapolis Convention and Visitors Bureau
1750 Hennepin Avenue
Minneapolis, Minn.

Please make reservations indicated below:

_____Single room(s) at $_____

_____Double bed rooms at $_____

_____Twin-bed rooms at $_____

_____Suite (specify type of accommodations wanted)

(Three choices MUST Be Shown)

First choice hotel _____

Second choice hotel _____

Third choice hotel _____

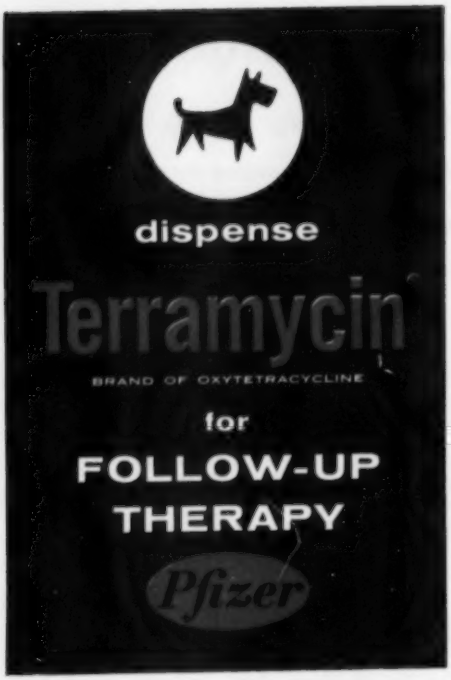
Arriving on (date) _____ at _____ a.m. _____ p.m.

Leaving on (date) _____ at _____ a.m. _____ p.m.

Room will be occupied by (attach list of additional names if necessary).

Your Name (Print or Type) _____

Street Address _____ City and State or Province _____



(CLASSIFIED ADS—*continued from p. 52*)

Four-room veterinary clinic and garage for sale; x-ray, instruments, drugs, etc.; $11,000; without adjacent lot, $8,500. Located on main highway. Address Dr. M. Parker, South 71, Fayetteville, Ark.

Small animal hospital for sale, Los Angeles suburb; well-equipped and supplied. No property involved. Excellent low-rental lease; $14,000 complete with low down payment. Address "Box P 19," c/o JOURNAL of the AVMA.

Small animal and dairy practice for sale; modern brick hospital, 55 cages, brick dwelling. Established 10 years; suitable for 1 or 2 veterinarians. Fine location on U.S. highway near northeastern Ohio city. Address "Box S 11," c/o JOURNAL of the AVMA.

Established large animal practice for sale in eastern Nebraska. My health forces me to sell property, drugs, and instruments; no blue sky, only small investment necessary. Excellent opportunity for hard worker. Address "Box S 13," c/o JOURNAL of the AVMA.

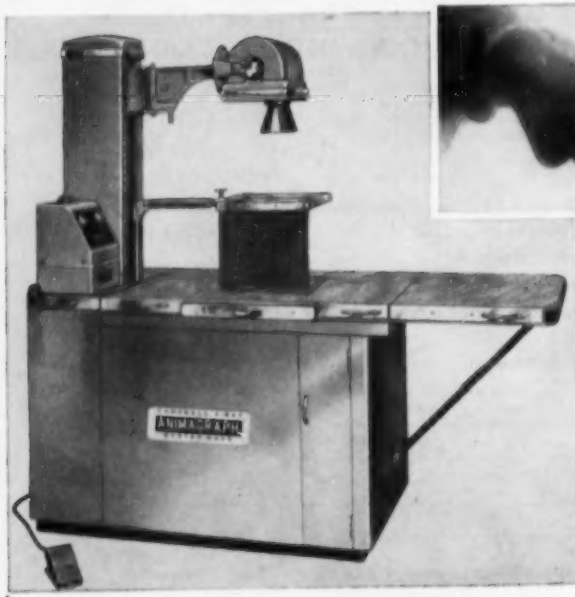
Small animal hospital for sale; select clientele in fabulous winter resort area of southern California. Excellent for semi-retirement; low overhead. Fully modern and equipped; $20,000 handles. Will lease. Address "Box S 15," c/o JOURNAL of the AVMA.

Animal hospital for rent; ideally located in New Jersey. Address "Box S 14," c/o JOURNAL of the AVMA.

Miscellaneous

Dog cages for sale, used 1 year; 8-cage unit, 10 ft.

(*Continued on p. 58*)



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(CLASSIFIED ADS—*continued from p. 56*)

long by 6 ft. high, removable trays. Manufactured by East River Wire Works; price, $175. Address Dr. P. H. Kramer, Lodi, Ohio.

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Pregnancy Diagnosis—in mare from 45th to 150th day. Write for vials and mailing tubes. Price: $7.00; 2 or more tests, $6.00 each. Pregnancy Diagnostic Laboratories, H. S. Lames, D.V.M., Dysart, Iowa.

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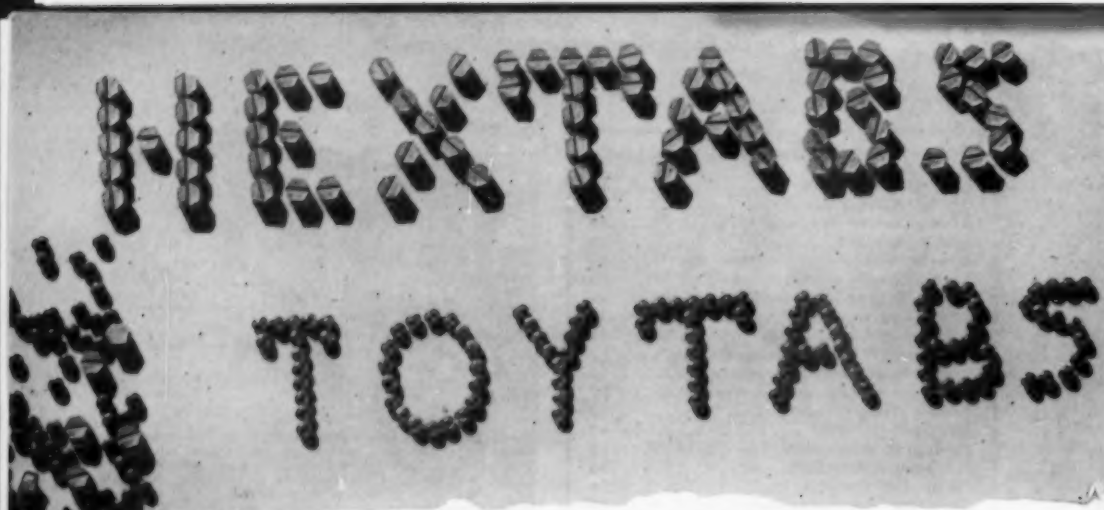

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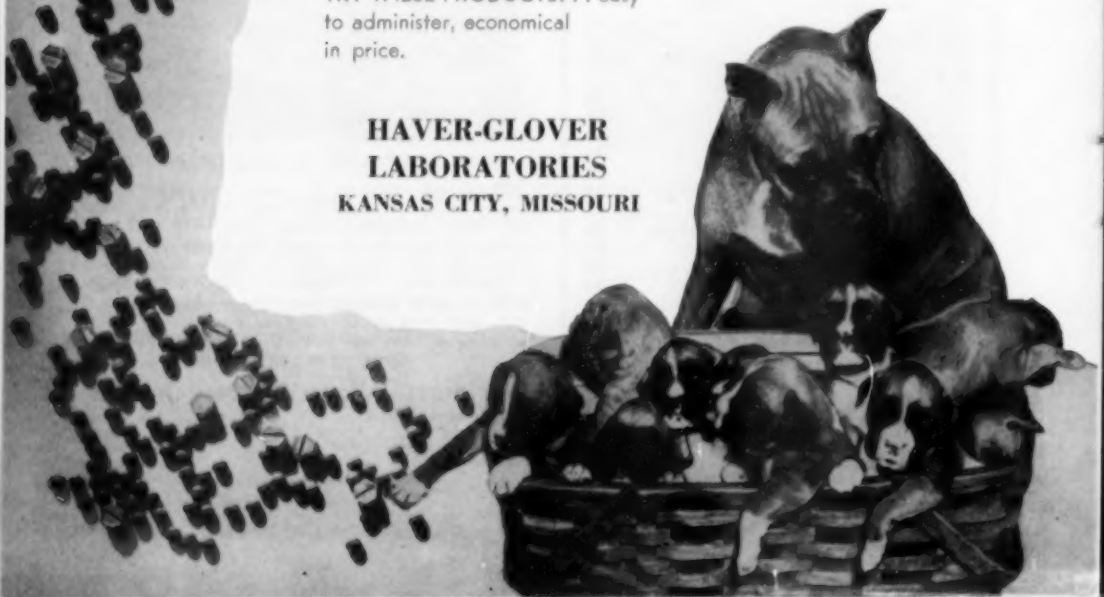

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